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PACIFIC MARINE REVIEW

JANUARY

1936

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Official Organ

PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

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OF THE PACIFIC COAST

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PACIFIC MARINE REVIEW

JANUARY, 1936
VOL. XXXIII NO. 1

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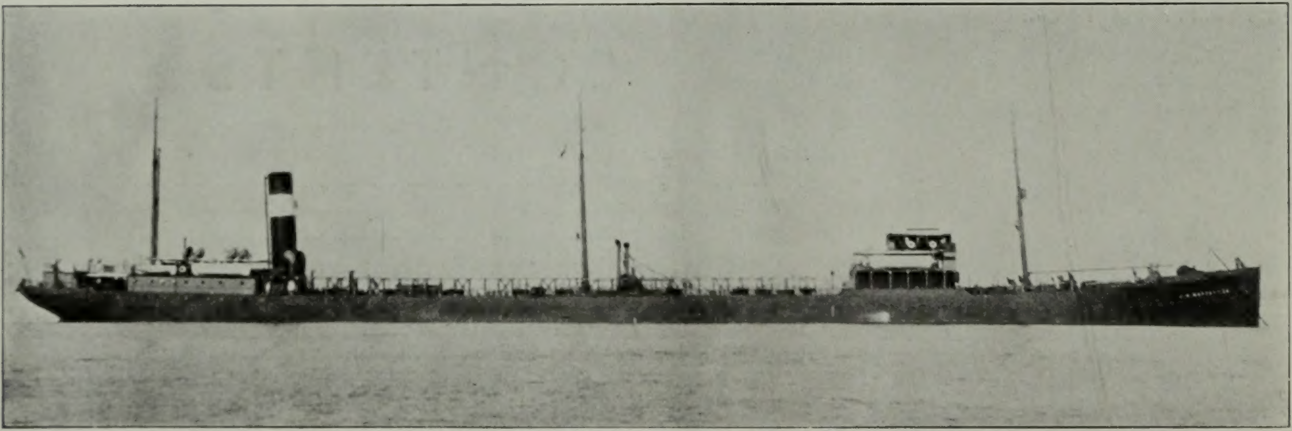

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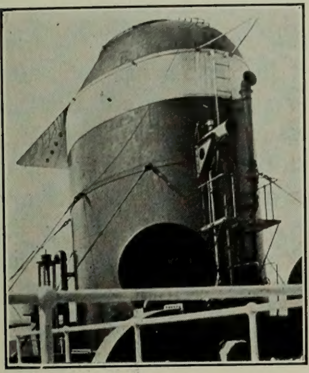
Editorial Comment »« »«



Full Speed Ahead

In many ways 1936 opens on a brighter prospect for American shipowners than has any new year since 1928.

Our "greatest depression in American history" is definitely over, and international trade volume is rapidly getting back to normal.

As R. Stanley Dollar, President of the Dollar Steamship Company, expresses it:

"I do not claim to be a prophet nor the son of a prophet, but in my opinion the cycle of the uncontrollable factors in our economic life, that have depressed business and human endeavor during the past five years, has completed its course and is now set for a successful period of development.

"What lies ahead is entirely up to us as individuals and as a nation.

"In marine terms, it is for us to set a true course and set the engine room telegraph for Full Speed Ahead.

"We no longer can use such old alibis as 'Overproduction,' 'stagnated markets,' and 'lack of purchasing power.'

"As we face 1936, we find that the so-called 'uncontrollable factors' are all in our favor, and so I am convinced that we face a year of unprecedented opportunity."

Judging from the usual criteria, such as volume of business, prices, future commitments, stock market trends, a very large proportion of American business life agrees with Mr. Dollar.

Prognosticating economists like Roger Babson are issuing very rosy statements.

The only uncertainties looking ahead for American shipping and American business are Congress and organized labor.

Congress can by carefully considered wise legislation set a true course on which the American shipper can give the order Full Speed Ahead for the American merchant marine, confident of the resulting benefit to his stockholders, to his employees, to himself, and to the nation.

Organized labor under wise leadership could have an intelligent partner in the maritime enterprises of America by cooperating to produce a better morale on shipboard and a better dispatch at ports.

Will our legislative leaders and our leaders of labor join in for wise cooperative action and give American shipping a fighting chance to achieve its real place on the sea in this new period of opportunity that seems so full of good hope?

Shipping Legislation

Congress, convening on January 3, has pending for consideration a tremendous mass of legislation, among which there is much material of great importance to American shipping.

The Bland bill, designed to take the place of the Merchant Marine Act of 1928, and to change the form of government aid from loans to direct grants in shipbuilding, and from postal contracts to direct subsidy in operating in the foreign trade, passed in the House at the last session. Its companion bill (Copeland), considerably modified by administration suggestion, was left pending in the Senate.

American shipping, under the present law, has added a number of fine new passenger and cargo liners to its foreign trading and intercoastal fleets, and has carried on despite the great depression. Were it not for the uncertainty of national policies in governmental aids to shipping, the American merchant marine would be ready to take full advantage of the opportunities now opening in world trade.

Another group of bills very important to the merchant marine has to do with the form of governmental control and railroad competition. Some of these bills would place all forms of transportation under an enlarged Interstate Commerce Commission. This would include railroads, bus lines, truck lines, inland waterways, air lines and steamship lines. Other bills in this group would modify the Interstate Commerce Act so as to allow the railroads a free hand in cut-throat competition with the intercoastal steamship lines, and the inland waterway carriers. Among this latter class is the Pettengill Bill, which would eliminate the so-called long and short haul clause of the I.C. Act and so cut the foundation out from under our Intercoastal Steamship Lines, thereby effecting great loss to many of our coastwise communities without any compensating benefit to any part of the country or its citizens.

It behooves Congress to tread warily at this time. The world is shaking off its depression. The American exporters are going out after trade with a good chance of success. The American shipowner is ready to build up his fleets to meet the demands of the trade. The American importer is finding more response to his selling appeal. All of these factors in the national prosperity need an unqualified assurance of the adoption by Congress of a constructive helpful policy in maritime and foreign trade relations between the Federal Administration agencies and the American citizen in overseas business. Above all, these factors need a firm assurance that such a policy will have the permanence necessary to justify large investment of funds.

Shipping and Labor

Organized labor as represented by the Maritime Federation of the Pacific Coast seems committed to a course that will, if continued, bring disaster, not only to the Pacific Coast shipping industry, but also to the Maritime Federation, whose members depend thereon for their livelihood.

In the 14 months since October, 1934, when the award was made by the arbitrators closing the longshoremen's strike, the leaders of the unions composing the Maritime Federation have incited a campaign of constant irritations, new demands, "cessations of work for collective bargaining," and plain old-fashioned soldiering on the job. As one result of this campaign, Pacific Coast ports which two years ago were near the top among the most efficient ports in the world, are now well down among the least efficient. The introduction of the shorter working day, higher hourly wage, and the avoidance of overtime, which, other things being equal, should result in a gain in tonnage handled, has brought on an opposite effect. Ship operators claim a falling off of from 30 to 50 per cent in the tons handled per man hour. Along with this has come carelessness and dishonesty; an increase in breakage of at least 30 per cent and a decided increase in pilferage and shortage of 20 per cent up to 40 per cent.

If the intention of the Maritime Federation of the Pacific Coast is to force the owners into bankruptcy, they are going about the job very effectively. Suppose that they accomplish that object. The evident alternative is government operation. Do the maritime unions want that?

Before they answer, it would be wise for their rank and file to consider the pay of similar ratings in government service, and the possibilities of calling strikes on Uncle Sam.

It would be a far wiser course, however, for the leaders and the rank and file of all the maritime unions to carefully consider ways and means of becoming a helpful rather than remaining a harmful influence in the operation of America's merchant shipping.

The Maritime Federation of the Pacific Coast might do well to consider itself in the business of selling to the American merchant marine: Efficient handling of cargo rather than man hours of a question mark; economical operation of a ship or an engine room rather than months of a certain grade certificate; competent seamanship rather than six or eight hours a day of soldiering and sixteen to eighteen hours of grousing.

The Maritime Federation of the Pacific Coast should cooperate in securing constructive legislation for the building up of an American Merchant Marine. To this end it should purge itself of the radical communistic elements in its membership and particularly in its leadership. Not otherwise can it demand consideration for its claims at Washington or on the American people.

America's merchant marine is facing a great opportunity. If maritime labor and Congress will cooperate, 1936 and the years to come should be the greatest in our marine industry.

America Needs More Tanker Tonnage

One of the striking trends in American shipping during the past three years has been the very rapid decrease in laid-up tankers. In November, 1931, there were eighty American flag tankers tied up. In November, 1932, this figure had grown to ninety-five tankers laid up. November, 1933, however, shows a decrease to 34 tankers idle and by November, 1935, the figure had shrunk to eight with charters being rapidly arranged for that remnant. It would be safe to say that on January 1, 1936, the American tanker fleet is practically 100 per cent active.

The same brisk demand for tankers exists in Europe. The Shipping World, London, on December 4, published an editorial on "Tanker Construction in Great Britain" from which we extract the following:

"There are under construction, or on order in this country at the present time, 18 tankers, totalling about 150,000 tons gross. It would not be surprising if before the end of the year this figure were raised to 200,000 tons, which would cover the normal replacement requirements of the oil companies.

"Private owners of tankers have little inducement to build new tonnage at the present time, but so far as the oil companies are concerned, their normal replacement program over the next few years will have apparently to be increased. In the first place, they still own a certain number of ships which were built before or during the war, and all those ships are now fifteen years old or over—in effect this is the obsolescent age of a tanker.

"They also own a considerable number of ships built in 1921 or 1922—the Americans own still more—and these ships are not likely to last much longer. Mr. Robert F. Hand, in a paper which he read recently before the North-East Coast Institution of Engineers and Shipbuilders, pointed out that the steel of which the tankers built immediately after the war were constructed left much to be desired in that it appeared to suffer from excessive corrosion. As a matter of fact, during the last few weeks, British oil companies have sold nine 1921-1922 built tankers for breaking up. There are undoubtedly more tanker orders to be placed in British shipyards and the flow of such orders may be expected to be fairly regular for two or three years to come".

It is not only on account of rapid deterioration and obsolescence in American tanker fleets that a much faster rate of replacement is indicated, but also because of the fast increase in the domestic and foreign use of petroleum and its products. For instance, in very recent years, oil fuel for domestic and industrial heating is rapidly displacing coal in the northern half of the United States generally and particularly on the Atlantic Coast. In the vicinity of New York a house of nine rooms would burn approximately eleven tons of oil a year. Practically all houses of the better class are being equipped with oil burning furnaces, and many coal burning plants have been converted to this cleaner and more easily controlled fuel. These heating plants use the so-called stove oil, which, together with gasoline, distillate, kerosene and other refinery derivatives demand clean tanker tonnage.

Thus all things considered we are looking forward to much activity in tanker building in American shipyards and since much of this type of tonnage is needed on the Pacific Coast, and the launching weights of large seagoing tankers are within the capacity of Pacific Coast ways, it is only reasonable to predict that some of this program will come to Pacific Coast shipbuilders.

Twenty-Five Years Ago

On January 1, 1911, Pacific Marine Review issued Number One of its eighth annual volume—a 44-page magazine—still the *"First Established and Only Exclusively Marine Paper Published on the Pacific Coast"* —from its office in Rooms 379 and 380 Arcade Annex, Seattle, Washington. A new cover design in two colors featured the giant trans-Pacific liner, Minnesota, steaming through the block letters of the title. There were 16 pages of advertisements and 28 of text.

In an editorial on "Shipping in Congress," the editor, H. B. Jayne, rejoiced "that President Taft has definitely and specifically declared himself in favor of fortifying the Panama Canal" and hoped and believed "that nothing . . . . will induce the United States to retire from the position it has taken in regard to this question"; suggested that "American registers be put on a more favorable basis than foreign registers" so far as canal tolls were concerned; feared that "with a Democratic House and a Republican Senate there is little prospect of the passage of general legislation to restore the American Merchant Marine to its pristine glory" even though he "had not quite lost that faith necessary to remove mountains"; and finally noted "with satisfaction that the daily press now devotes much space to this important national issue."

For the third time the matter of suspending the coastwise laws for Hawaii was up in Congress and there was much agitation by Pacific Coast shipping men against the passage of a bill opening that trade to foreign registers. "As a unit, the San Francisco shipping men are up in arms against the enactment" of this measure.

On December 23, 1910, the new American-Hawaiian passenger and cargo steamer, Honolulan, arrived in Seattle, 14,000 miles and 54 days out from Baltimore via the Straits of Magellan. Meeting with extremely heavy fog during the last few days of her trip she navigated by Submarine Bell signal, holding communication with the Umatilla lightship for a distance of 13 miles without difficulty. The Honolulan was loaded with 14,000 barrels of fuel oil and 7000 tons of Cumberland coal.

H. F. Alexander, general manager of the Alaska Coast Company, was trying to collect on a $65,000 policy on the steamship Kentucky, sunk off Cape Hatteras, February 14, 1910, while on her way to the Pacific Coast for service to Alaska. There was some hope that two-thirds of the policy face value would be paid.

Captain J. W. Trout, marine superintendent of the Canadian Pacific Railway Company was busy investigating fuel oil burning under marine boilers with a view to changing the Canadian Pacific fleet to oil.

The Lighthouse Bureau was asking Congress for an appropriation of $376,400 for lighthouses and other aids to navigation on the Alaska coast.

On November 5, Robert Dollar had returned to San Francisco from a business trip to the Orient, during which he acted as official good will ambassador for the San Francisco Chamber of Commece. He reported very bright prospects for a large increase in Oriental trade with the Pacific Coast.

Andrew Furuseth had just been elected President of the International Seamens Union at its fifteenth annual convention.

Intercoastal Shipping Versus Railroad Legislation

The Pettengill Bill and all Similar Legislation Must be Defeated in Order to Preserve Our Intercoastal Merchant Marine

By George E. Talmage

Freight Traffic Manager, Panama Pacific Line

Legislation, far reaching in its effect upon domestic water carriers, will undoubtedly be introduced in the coming session of the 74th Congress. Not least in importance among such bills will be those supported by the Association of American Railroads including resubmission of the Pettengill Bill (HR 3263 at the first session of the 74th Congress), or similar legislation.

Mr. R. V. Fletcher, their general counsel, in a speech before the Reading, Pa., Chamber of Commerce, recently stated his Association had agreed upon a legislative program, passage of which they propose to seek from Congress at the coming session. The first two items on their program were an amendment to the Fourth Section of the Interstate Commerce Act, particularly with regard to the long haul and short haul restrictions therein, and secondly repeal of the Panama Canal Act of 1912, which forbade any railroad having any interest whatsoever in a common carrier by water operated through the Panama Canal or elsewhere, with which said railroad does or may compete for traffic.

The implications of this program are so far reaching for water carriers that it requires the most searching analysis as to the motives back of it. Perhaps no better approach can be made than by a look at the situation prior to the adoption of such legislation, and the purposes of Congress in passing both the Panama Canal Act and amending the Fourth Section of the Interstate Commerce Act to its present form.

● Intercoastal History

Prior to the opening of the Panama Canal there had been for many years a degree of water transportation between the Atlantic and Pacific Coasts of the United States, both via Cape Horn and also via the Isthmus of Panama and of Tehuantepec. As early as 1871 the Union Pacific and Central Pacific Railroads attacked this water commerce by eliminating the Pacific Mail Steamship Company service as a common carrier, through contracting for all space on these steamers at a figure and often running the steamships empty. This arrangement was taken over in 1881 by the Transcontinental Association which continued it until 1883. By

Many fine steamers have been built in American shipyards for the intercoastal service. Here is Santa Rosa, one of four sisters built by the Grace Lines.

Cargo Liner Dorothy Luckenbach, one of the larger type cargo liners especially designed for intercoastal service.

this means the railroads were able to eliminate independent intercoastal ship operation.

In 1883 the Southern Pacific Railroad Company commenced water service between New York and New Orleans, connecting with the railroad from the latter point to San Francisco. A Southern Pacific Railroad official at the time was quoted to the effect that this line was looked upon generally to "take care" of water competition. The result, of course, was to allow the Transcontinental railroads to maintain very high rate structures free of competition from the more economical water route. So great was the bitterness aroused by this policy that in 1892 an organization of San Francisco merchants instituted a boat line of their own to the East, which brought on a heavy rate war and which was ultimately abandoned when rail rates were reduced to absurdly low figures. Needless to say, with the elimination of this second attempt at intercoastal water service, the railroad rates returned to their former level.

It was not until the opening of the Panama Canal that it was possible for the full economies of water transportation between the Atlantic, Gulf and Pacific Coasts to be made available to the public. Apparently in the view of Congress in 1912, as evidenced by their passage of the Panama Canal Act, this economy would not have been available unless the railroads were restricted against control of the water carriers such as they had succeeded in maintaining over a period of nearly forty years prior thereto.

● Monopolistic Motives

In the light of this history, it is hard to see what purpose the Association of American Railroads may have in seeking repeal of the Panama Canal Act, except the elimination of such water competition through their ability once more to control it and to stifle development to the detriment of the general public.

It would also seem obvious that the program to seek amendment to the Fourth Section of the Interstate Commerce Act must be motivated by a similar desire to eliminate water competition. Some very pertinent comments upon the situation have been made by Mr. Joseph B. Eastman, Federal Coordinator in his reports. A few brief quotations indicate clearly his view as to the reasons why this section of the law is in the public interest. In his annual report for 1934 Mr. Eastman said:

"The Long and Short Haul Clause was designed to eliminate the pernicious practice of charging higher rates for shorter than for longer hauls which had become widely prevalent prior to 1887 as a result of unrestrained resort to competitive ratemaking."

"Very low rates were maintained by the railroads at water-competitive points, and relatively very high rates at intermediate points which did not enjoy this competition. The competitive rates were often on a level which would have driven the railroads into bankruptcy, if it had been necessary to establish similar rates on all their traffic."

"The forms of discrimination against which Section Four is direct-

American cargo carrier Point Ancha of the Gulf Pacific Mail Line in the Panama Canal.

ed are particularly flagrant forms which tend to arouse acute public dissatisfaction."

● Reasonable Compensation

The present Fourth Section contains a specific prohibition against the maintenance of lower rates for a longer haul than for a shorter intermediate haul under certain conditions, unless the Interstate Commerce Commission, after investigation, so authorizes and subject to the statutory restriction "that the Commission shall not permit the establishment of any charge to or from the more distant point that is not reasonably compensatory for the service performed". Paragraph 2 of Section Four further states that "wherever a carrier by railroad shall in competition with a water route or routes reduce the rates on the carriage of any species of freight to or from competitive points, it shall not be permitted to increase such rates unless, after hearing by the Commission, it shall be found that such proposed increases rest upon changed condition other than the elimination of water competition".

The Commission in Transcontinental Cases of 1922 defined the term "reasonably compensatory" as follows:

"The words 'reasonably compensatory' imply that a rate properly so described must (1) cover and more than cover the extra or additional expense incurred in handling the traffic to which it applies; (2) be no lower than necessary to meet existing competition; (3) not be so low as to threaten the extinction of legitimate competition by water carriers; and (4) not impose an undue burden on other traffic or jeopardize the appropriate return on the value of carrier property generally."

American-Hawaiian cargo carrier Arizonan in the Panama Canal.

Surely the burden of proof that proposed lower long-haul rates are "reasonably compensatory," placed on the rail applicant by the present Fourth Section, would not seem an undue hardship. Further, in seeking to eliminate the requirement that rates so reduced to meet water competition cannot again be raised unless the increase rests upon other causes than the elimination of water competition, the railroads give away their real intentions.

● Coordinated Regulation

The railroads have complained repeatedly that their competitors were insufficiently regulated. It is true that there are many conflicting views as to the wisest form of coordinated regulation. However, if coordinated regulation is a desideratum in the interest of developing each method of transportation within the field where it offers the public the greatest economies, the legislative program outlined above can hardly be considered as helpful; it must be viewed rather as a purely competitive effort by the railroads to eliminate the water lines. Inasmuch as within its field water transportation is provably more economical, there appears to be no justification for a program which would tend to destroy it. Further, it could not be possible for the railroads, with their less economical operation, to take over such traffic as the water carriers are presently handling and handle it profitably at equivalent rate levels. There could be but one second step after the railroads once succeeded in eliminating the water competition: restoration of rate levels on such traffic considerably in excess of what water carriers might profitably maintain.

Nelson Line cargo carrier Sacramento in a Panama Canal lock.

The volume of American flag shipping engaged presently in the intercoastal trade and including as it does many modern vessels built especially for that trade, represents an important naval auxiliary in time of war. The tremendous financial burden placed upon the American people by the absence of a Merchant Marine when we entered the last war would seem to suggest the undesirability of any legislative action which would tend to cripple this invaluable arm of the American Merchant Marine.

. . . . An American
Merchant Marine Policy

As Developed from the Results of a Nation-Wide Questionnaire Sent Out by the American Merchant Marine Conference, New York, Nov. 18th

In view of the fact that Congress will, at its coming session, have under consideration the enactment of legislation designed to establish a comprehensive policy with respect to a national mercantile marine, it was thought desirable that the conference make an effort to frame a statement of opinion as to what the mercantile marine policy of the United States should be. This statement, if possible, to represent the opinion of the general public, and of all classes of individuals and organizations directly interested in the welfare of the American shipping industry.

A committee was chosen to frame this statement of opinion. This committee, in turn, chose a select committee, which prepared questionnaires for distribution throughout the United States to Chambers of Commerce, editors of newspapers and periodicals, government officials, and to all classes of individuals and organizations interested directly or indirectly in the shipping and allied industries. The replies to these questionnaires were received and analyzed by the questionnaire committee. The results of the analysis show unmistakably that it is the concensus of opinion in the United States that:

I. The United States should have a definite, and as nearly as may be, a permanent merchant marine policy, the cardinal features of which should be:

1. The United States should have a merchant marine sufficient in size to carry its domestic water-borne commerce and at least one-half its water-borne foreign trade.

2. The ships of the merchant marine should be safe, properly equipped, and suitable in all respects for the trade in which engaged; they should be capable of use as a means of national defense in time of war; they should be built in American shipyards and be manned by American officers and so far as practicable by American crews.

3. The merchant marine should be privately owned and operated.

II. To give effect to this policy legislation should be enacted:

1. To provide direct subsidies for American ships engaged in foreign trade, such subsidies to be of two kinds:

a. A construction subsidy equal to the difference in the cost of building ships in America and in foreign shipyards.

b. An operating subsidy which will cover not only the difference in the cost of operating American ships and competing foreign ships, but which will also be sufficient to balance advantages possessed by foreign ships by reason of subsidies; subventions, or other forms of governmental aid or preference.

2. To create an independent commission or maritime authority whose duty it shall be:

a. To administer all matters connected with the granting and payment of subsidies.

b. To promote and encourage the development and growth of the merchant marine in both the foreign and domestic trade.

The questionnaires distributed were of two kinds. The first, which dealt only with the broad and general phases of shipping and commercial policy, was sent to Chambers of Commerce, to the editors of newspapers, and to various educators, publicists and leaders of thought and opinion. The second questionnaire went to the operators of steamship lines, employed both in foreign and in domestic commerce, to shipbuilders and ship repair yards, to naval architects, editors of marine periodicals, steamship agents, Propeller Clubs and various government officials. This questionnaire dealt not only with the general aspects of shipping policy, but also with certain details of administration and regulation, and with other matters affecting the operation of ships in foreign and domestic trade.

In some places the report reflects differences of opinion, for it was hardly to be expected that there could be unanimous agreement among the many varied interests from which replies were received. Upon all broad matters of shipping policy, however, there was virtual unanimity in the replies to both questionnaires. Differences, if any, arose only in connection with matters of detail with regard to administration, regulation and operating practices.

The most significant facts brought out by the questionnaires were those disclosed by the replies received from newspapers, trade bodies and other leaders of public opinion. These replies came from thirty states, eight in the Atlantic Coast, two in the Pacific Coast, three in the Gulf, two in New England, one in the West, and the others in the Ohio-Mississippi Valley.

Without exception these replies favored the development of an adequate merchant marine, privately owned and privately operated. With a single exception, and this was qualified, all replies favored the granting of direct governmental subsidies to make the construction and operation of such a merchant marine possible.

The preparation and distribution of the questionnaires, and the ana-

(Page 30. Please)

R. L. Hague, General Manager,
Marine Department, Standard Oil Company of New Jersey.

First American
Arcform Tankers

Standard Oil Company of New Jersey Building Two Steam Turbine Drive Single Screw Tankers of the Isherwood Arcform Design at the Federal Shipbuilding and Dry Dock Company

Bow view of tanker R. P. Resor sliding down the ways.

Early in 1934, the Federal Shipbuilding and Drydock Company sensed the great need for new American tanker tonnage. The technical staff of the yard was ordered to make a study of hull forms and of the particular needs of oil companies as to size and speed. Several models were tested in the towing tank, and considerable experimenting was done with hull appendages.

As a result of this preliminary work, a design was prepared for an Isherwood Arcform single-screw hull that would carry 12,500 tons deadweight on 28-foot draft; would have a capacity of 100,000 barrels of oil cargo; and would maintain a sea service speed fully loaded of 11.75 knots on 3000 shaft horsepower.

In January, 1935, the keel for a ship to be built to this design was laid down at the yard on the yard's account and a month or two later the keel was laid for the second tanker. That this speculative building was fully justified is amply proven by the fact that the Standard Shipping Company, largest tank operators in the world, bought these two tankers while they were still in frame on the stocks.

Shortly after this purchase, the two hulls were named after two officials of the Standard Oil Company. The first, Hull No. 136, received the name of R. P. Resor, treasurer of the Standard Oil Company of New Jersey, and the second, Hull No. 137, took the name of T. C. McCobb, member of the Board of Directors and Comptroller of the same company.

While the design of the tankers is conservative as to size, speed, and steam conditions, there are a number of features included in the hull which make them the first of their type to be built in American shipyards, and a number of items in their machinery equipment which are first installations anywhere. These facts taken in conjunction with the present great need of new American tanker tonnage led the Pacific Marine Review in cooperation with the builders and owners of these vessels to prepare a fully illustrated detail description of the design, construction and equipment thereof.

The design calls for construction on the Isherwood longitudinal, bracketless system to the patented Isherwood Arcform lines. Isherwood Arcform is comparatively recent in development. It was brought out by Sir Joseph Isherwood, noted British naval architect, in 1932, and first used in the design of the steamer Arcwear, a steam freighter of 7080 tons deadweight capacity, built by Isherwood for his own account. This vessel, on her trials in January, 1934, exceeded all expectations as to propulsive economy. S.S. Arcwear and several other European Arcform ships have maintained exceptionally good performance records in sea service. Exhaustive model tests at the British towing tank at Teddington and at the U.S. towing tank at Washington indicate savings in power for a given speed of from 13 to 15 per cent over normal tanker forms and on this basis it was predicted that the tankers building at Federal Shipbuilding and Drydock Company would attain a speed of 13 knots on trial and could maintain 12 knots at sea fully loaded. Due to the increased capacity given by this form, these tankers will carry their full capacity—100,000 barrels in gasoline. This capacity is said to be the largest yet attained in any tanker of the same overall dimensions.

A very decided advantage of the Arcform is that it maintains the propulsive efficiency of a ship within very narrow limits over a wide range of speeds. Considered, therefore, solely from the point of view that they are America's first Arcform hulls, performance of the tankers, R. P. Resor and T. C. McCobb will

Lynn H. Korndorff,
President Federal Shipbuilding and Dry Dock Company.

be watched with great interest by American tanker operators.

In the detail design and construction of the hulls there are several features worthy of note. First, all bottom plating is lapped with the outside butt facing forward instead of aft, and these butts are nicely half rounded. This is expected to give an appreciable addition to propulsive efficiency.

Second, welding is used wherever safe and practicable. A full riveted hull of the same type and size would take over a million rivets. Only 340,000 rivets were used in each of these hulls. The longitudinal bulkheads in cargo tanks and much of the transverse bulk heading are fully welded. Much of the superstructure is welded and many hull appendages. All piping over 1½ inches diameter is welded throughout.

Third, the stern of each ship is fitted with contra-propeller sternpost, and in addition the Federal contra-guide rudder is used.

Fourth, they are the first ships to be finished and equipped to the new rules of the United States Steamboat Inspection Service which include some new ideas in fire-proof construction and a number of new items in safe navigation and life-saving equipment.

Fifth, in the propulsion machinery, we find a new design of, and location for, the steam generating plant, and some details of turbine construction new in marine application.

● General Description

The ships are single screw bulk oil tankers, driven by cross compound impulse reaction steam turbines connected to the propeller shaft by double reduction helical gearing. Steam for the turbines is supplied by watertube boilers. The hull carries two masts and a streamlined stack, and has the usual tanker bridge and pilot house erection connected by an elevated walkway to the poopdeck and afterhouse.

Each hull is divided into 14 watertight compartments by 13 bulkheads. From stem to stern these compartments include: forepeak tank with stores above; ballast tank with dry cargo above; forward cofferdam; cargo oil tanks Nos. 1, 2, 3, 4, 5, 6, and 7; after cofferdam; fuel oil tanks; machinery space; and afterpeak tank. Each cargo tank is divided by two longitudinal bulkheads into three compartments. As indicated on the general arrangement and machinery arrangement plans herewith, the cargo pumproom is located just forward of the machinery space and between the two wing fuel oil tanks.

The principal general characteristics of these hulls are:

Length overall	445 feet
L. B. P.	435 feet
Beam molded	66 ft., 6 in.
Draft loaded	28 feet
Displacement	16,750 tons
Deadweight capacity	12,500 tons
Shaft horsepower	3000
Propeller speed	90 r.p.m.
Trial speed guarantee	12.5 knots
Cargo tank capacity	100,000 bbls.

The bows have considerable flare, an important feature in the Isherwood Arcform design, and one which has proved of great advantage in steaming into head seas.

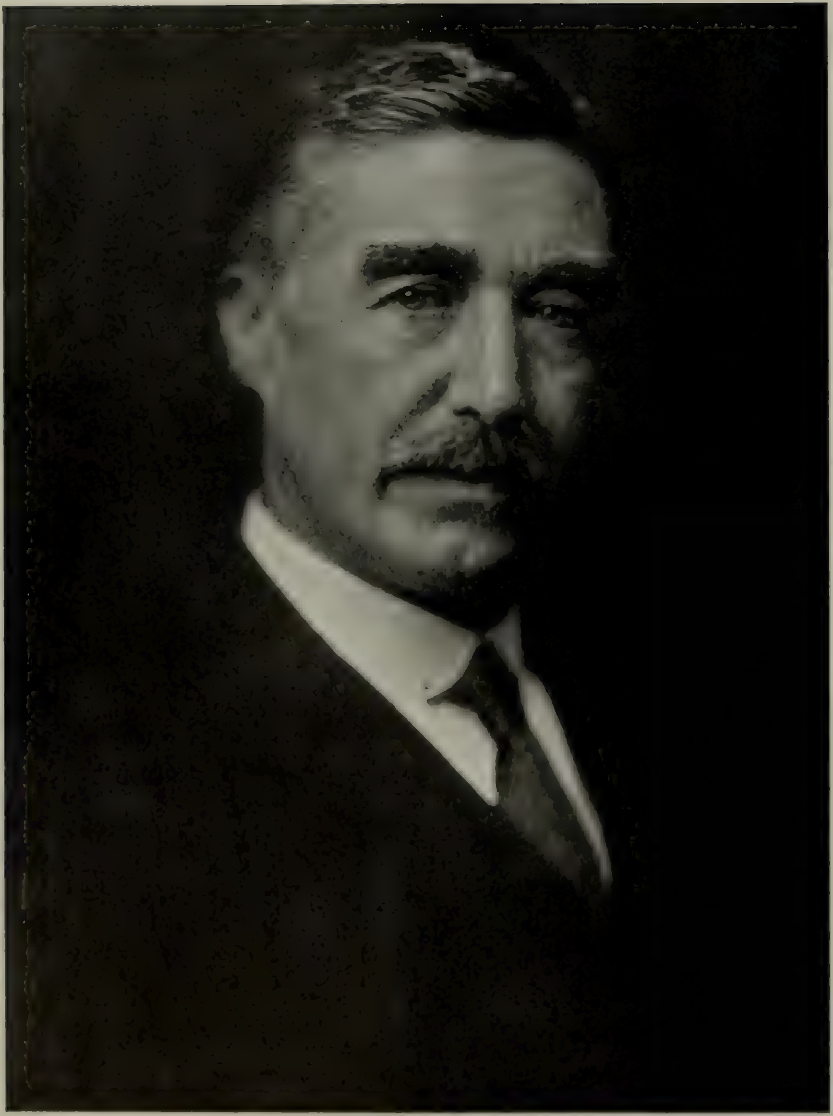
● Machinery Spaces

The arrangement of all machinery and the principal equipment is shown very clearly on the plans in the insert and on pages 17, 18, and 19—also a full list of items with index numbers for reference on the plans. Specifications for machinery include the following stipulations of interest to engineers:

The propulsive machinery to be built to meet requirements of American Bureau of Shipping and U. S. Steamboat Inspection Service, and to be classed by the American Bureau.

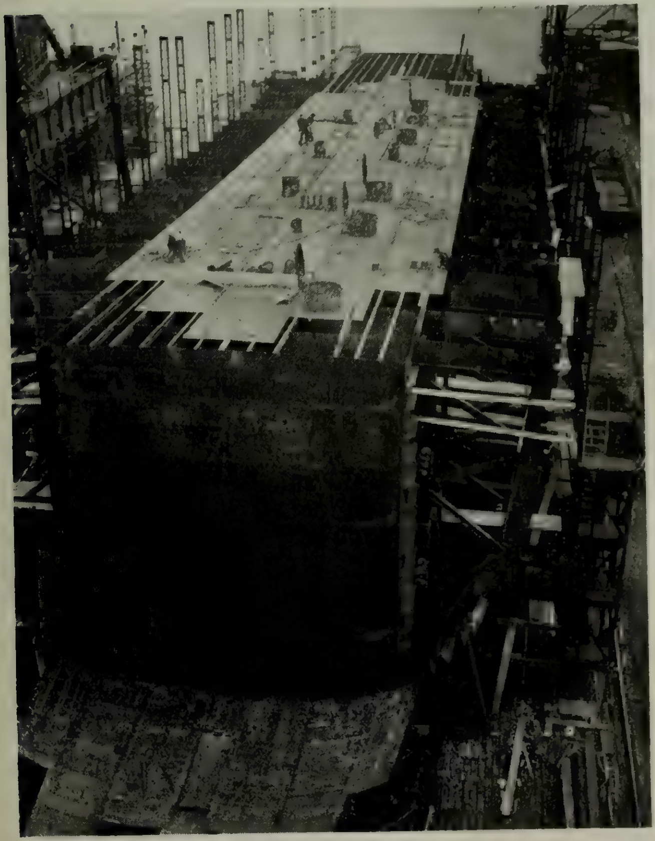
Engine room ladders to be of inclined type where possible, to have steel side bars and cast iron treads,

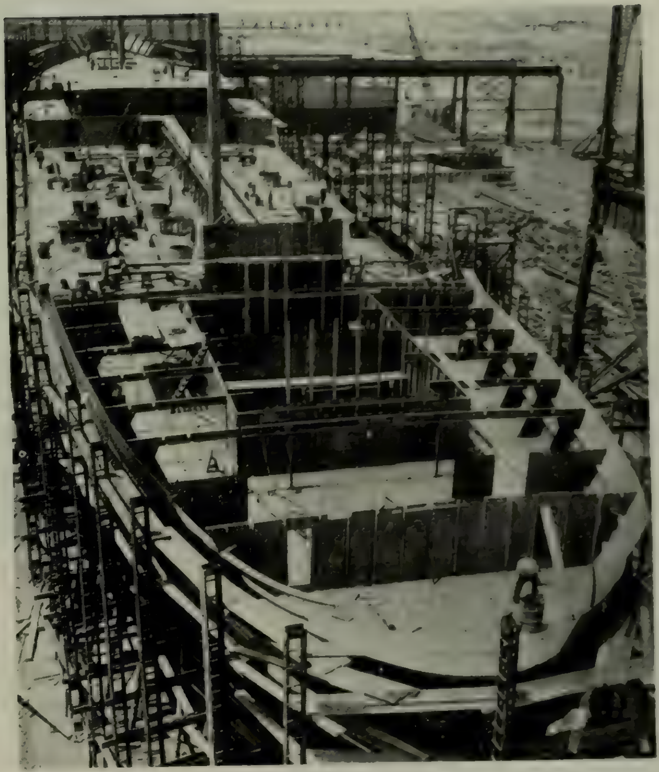
Quartering view of R. P. Resor in the stream after launching.



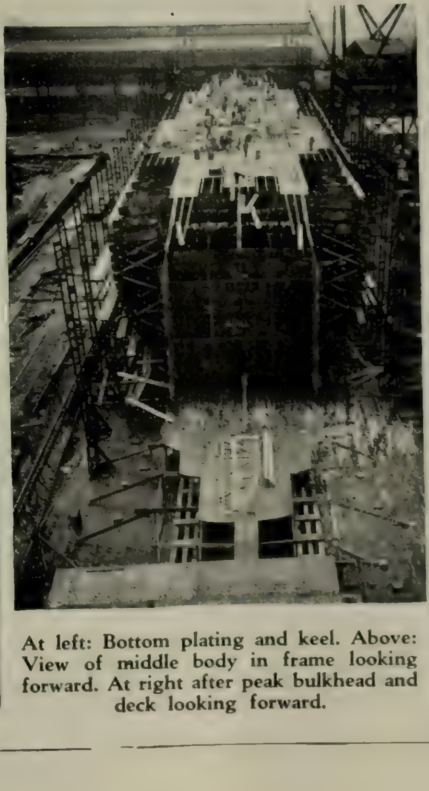
Sir Joseph W. Isherwood, N.A.

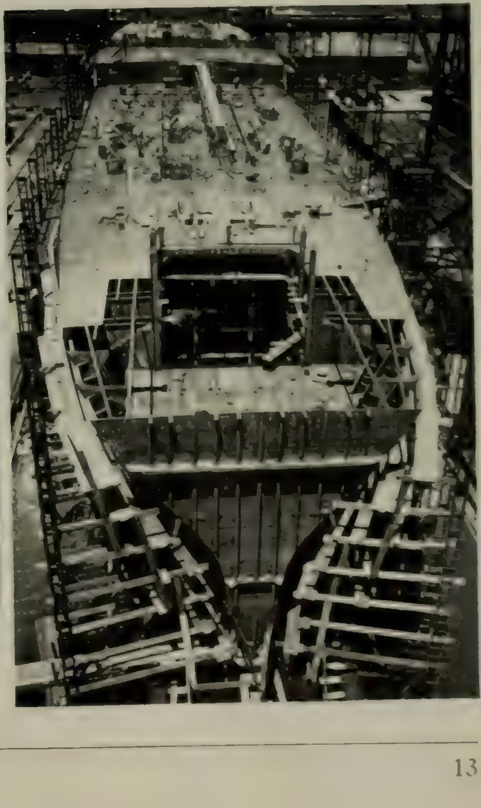
Progress Pictures of Hull of R.P. Resor



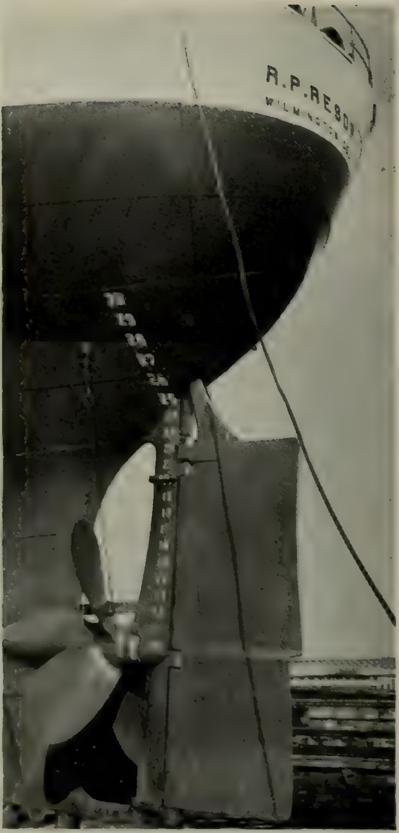


At left: The middle body of the ship in frame and partly plated, looking aft. Note at bottom the trestle template forms for the arcform lines. Above: View of hull fully decked with superstructures under erection looking forward from aft of stern.





At left: Bottom plating and keel. Above: View of middle body in frame looking forward. At right after peak bulkhead and deck looking forward.



Right and left are bow and stern views of the tanker on the ways ready for launching. Above: Mr. and Mrs. R. P. Resor and family. R. P., now treasurer of the Standard Oil Company of New Jersey, has been 46 years in Standard Oil Service, working up from office boy, through the accounting and auditing departments.

and to be furnished with dust pans of galvanized steel. All engine room gratings to be Carnegie staggered tread type, except the operating platform, which will be of Kerlow type grating. All engine room hand rails to be 1-inch diameter, cold rolled steel.

Ventilation by natural draft is provided for all engine room and fire room space. For the cargo pump room an Ilg, electric motor driven exhauster is located in the pump room deck house. This exhauster has a capacity of 1200 cubic feet of free air per minute and will draw air from the space under the pump-room gratings and discharge into the atmosphere.

All piping, fittings, valves, and surfaces of main and auxiliary machinery subjected to temperature in excess of 130 degrees Fahrenheit will be so insulated that the surface temperature will not exceed 130 degrees Fahrenheit when the ambient temperature is 100 degrees Fahrenheit. Insulating material to be used is Rockwool for the boiler casings; 85 per cent Magnesia composition for all other surfaces under 600 degrees Fahrenheit; and Superex, or a combination of Superex and 85 per cent Magnesia for temperatures 600 degrees Fahrenheit or over. Insulation for piping to be of sectional type, covered with canvas or asbestos cloth. Insulation for flat or large curved surfaces to be in block form finished with hard finish asbestos cement.

● Stern Frame and Rudder

One of the features given special attention when planning the tankers R. P. Resor and T. C. McCobb, was the design of the stern frame and rudder from the standpoint of obtaining the maximum propulsive efficiency, the best possible steering and maneuvering qualities, and low rudder torque.

After a thorough series of model basin tests with different types of streamline rudders, and various combinations of Contrapropellers, the design shown in the accompanying illustration, and known as the Contra-Guide Rudder was adopted.

Although the Contra-Guide Rudder has been installed on a number of ships in service, including the Waterman Steamship Company's vessels Topa Topa, Antinous and Hastings, these tankers are the first installations of this type of rudder on new vessels in the United States.

The normal type of Contrarudder is the combination of the fixed Contrapropeller, which is attached to the rudder post, and a symmetrical streamline rudder. Its object is to take the rotary motion out of the propeller jet and deflect the water aft in a straight rearward direction. This results in increased speed for the same shaft horsepower, or if the speed is kept constant, a corresponding decrease in shaft horsepower or fuel consumption. Additional advantages are better steering and maneuvering and decreased rudder torque.

In the Contra-Guide Rudder the rudder itself, as well as the Contrapropeller is given a curved surface; the curvature being to port above the centerline of the shaft and to starboard below the centerline. In this way the entire arrangement including the rudder acts as a Contrapropeller and thus the effective Contrapropeller Area is considerably increased over that of the normal type Contrarudder.

The table herewith summarizing the results of a Model Basin test with a vessel 406.8 feet x 54 feet x 23.5 feet, shows the improvement resulting from the normal Contrarudder and Contra-Guide Rudder, as compared with the ordinary single plate rudder.

	S.H.P.			PERCENT SAVING	
Speed	Plate	Contra	Contraguide	Contra	Contraguide
10 knot	1641	1388	1322	15.5	19.5
10.5 knot	1925	1627	1555	15.5	19.3
11 knot	2279	1936	1841	15.0	19.2
11.5 knot	2720	2325	2225	14.5	18.2

At the designed speed, 11 knots, the normal Contrarudder showed a saving in shaft horsepower of 15 per cent, while the Contra-Guide Rudder indicated a gain of 19.2 per cent.

A comparison of rudder torques for the same model shows:

	Side Pressure 1100 grams	
	Rudder Angle	Torque (cmg)
Plate	20°	3050
Contra	14.5°	1775
Contra-Guide	13.5°	1300

It will be noted that for a given side pressure, the torque with the Contrarudder was 43 per cent less than with the Plate Rudder, and with the Contra-Guide Rudder, there was a reduction of 58 per cent.

This comparison also shows that for angles of helm of 13.5 degrees and 14.5 degrees, respectively, for a Contra-Guide Rudder and Contrarudder, the steering effect is equal to that obtained with an angle of helm of 20 degrees for a Plate Rudder. Maintaining a course with minimum helm helps to increase the speed of the vessel.

Another test recently made with the model of a 500 foot tanker in one of the leading experimental basins with a Contra-Guide Rudder, gave the highest propulsive efficiency ever obtained in that basin.

In regard to the construction of the Contra-Guide Rudder fitted to the R. P. Resor and to the T. C. McCobb, it can be said that the design and workmanship is in keeping with the soundness and thoroughness of the other parts of these tankers.

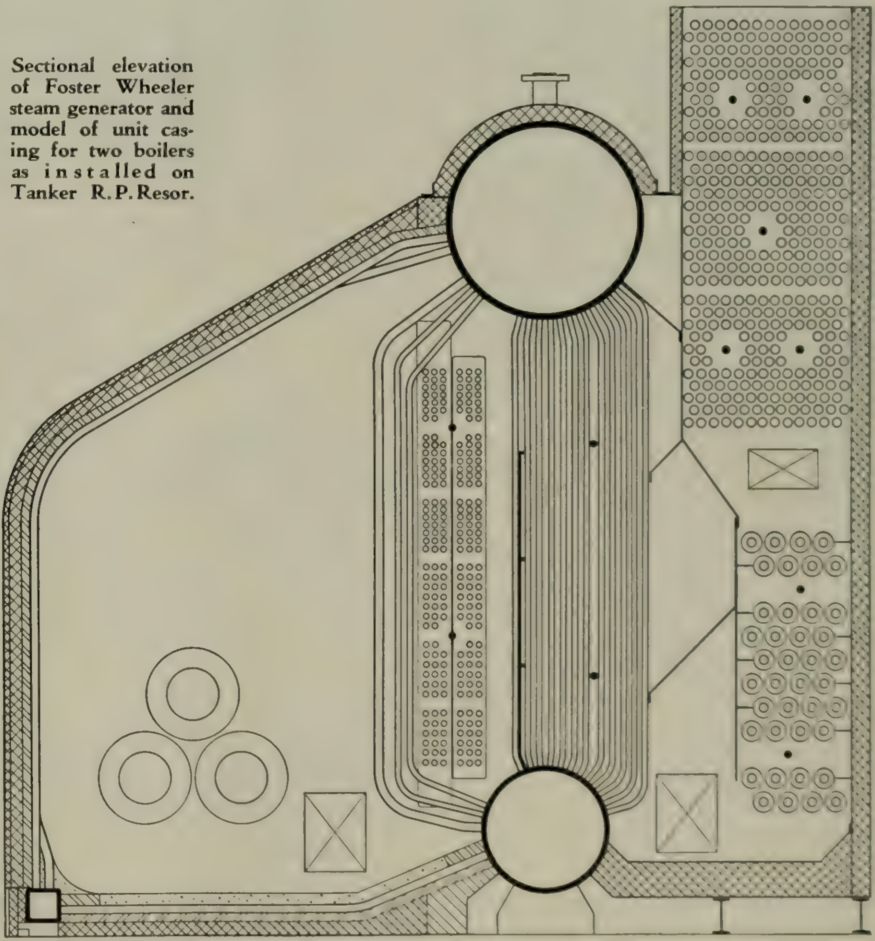
The Contrapropeller, which also serves as the rudder post, is a steel casting in one piece, riveted through two flanges to corresponding flanges which are a part of the stern frame. No portion of the Contrapropeller or stern frame need be disturbed when unshipping or shipping the screw propeller.

The rudder consists of a cast steel frame to which is electrically welded the side plates. Three large pintles are used.

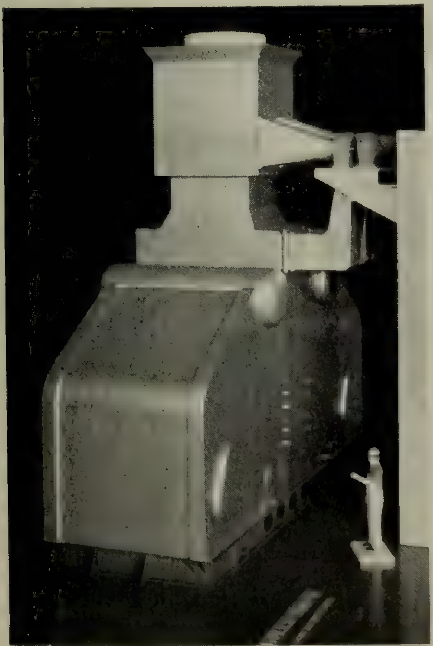
● Steam Generating Units

The steam generating equipment of the tankers is quite novel insofar as marine engineering is concerned. This applies to the design, location and construction of the boiler units. The steam generators are of the "D" type, two per ship, set in battery with a single steel casing. The boiler position is far aft above the engine room which results in entire elimination of uptakes, the stack connecting directly to the discharge casing just above the air preheater outlet. The boiler drums are of fusion welded construction — no rivets being used. The design was developed to meet the specific conditions of compactness, lightness and space limitations prevailing in that particular part of the vessel.

The two steam generators are of Foster Wheeler design and construction and are composed of two drums, the steam drum being placed directly above the water drum and connected to it by banks of vertical



Sectional elevation of Foster Wheeler steam generator and model of unit casing for two boilers as installed on Tanker R. P. Resor.



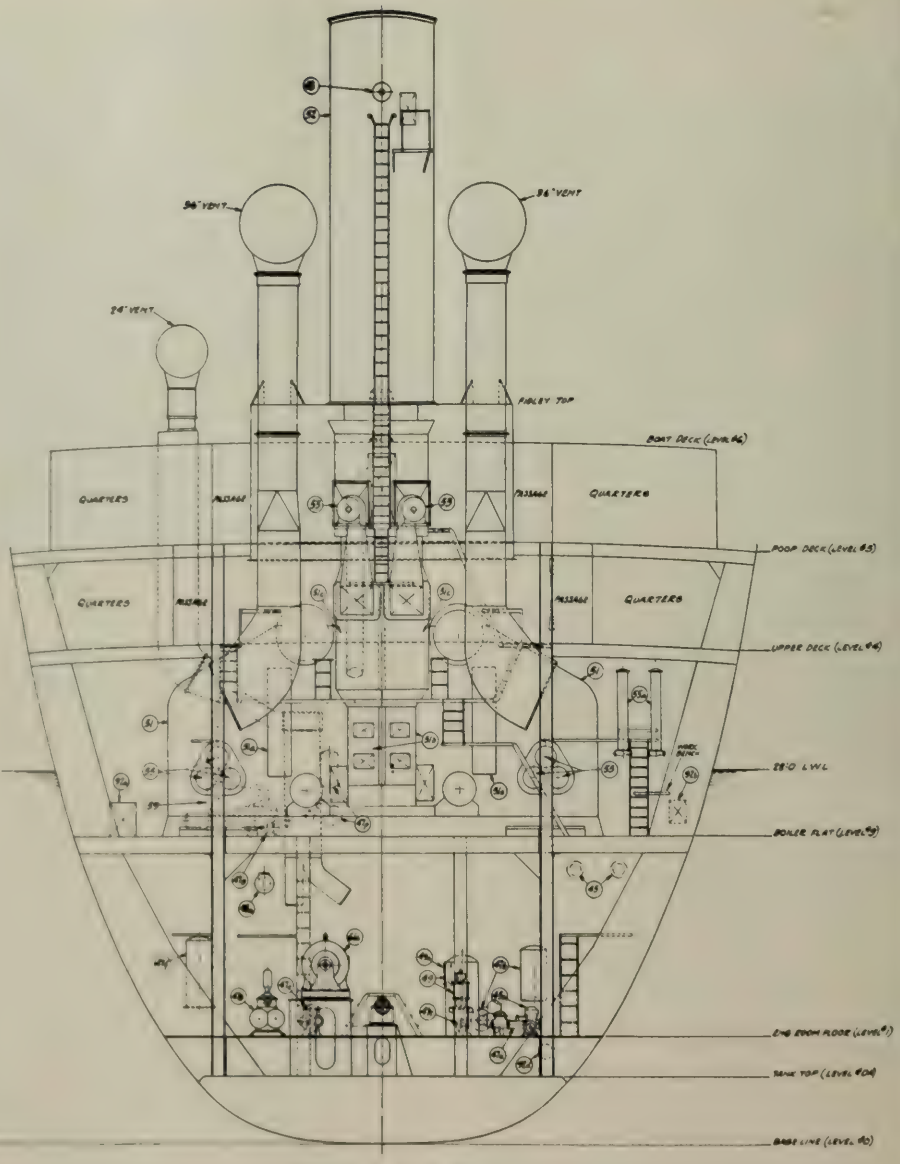
tubes. The tubes are so arranged that space is left between the third and fourth rows from the fire for the installation of a convection superheater. A steel baffle provides two gas passes through the boiler heating surface, the gases then flowing through an economizer of the extended surface, cast iron, armored marine type. Final heat recovery is effected through the use of a tubular air preheater. The boiler, superheater, economizer and air preheater are fitted with steam soot blowers. Desuperheaters and feed water regulators are installed.

The furnace is of "D" shape with water cooling tubes in the floor, front wall and roof. Firing is through three oil burners placed in one side wall of the furnace. This arrangement gives ample refractory with which to maintain a sufficiently hot furnace for rapid combustion, yet insures cool floor plates and substantial front wall and roof construction without thick, heavy refractory.

Placing two such boilers in a steel encased battery, with the economizers and air preheaters adjacent at the center of the ship and the furnaces toward the sides of the vessel, gives maximum compactness without sacrificing accessibility. All air preheater and economizer tubes are of 2-inch diameter and may be replaced individually without removing any of the tubes. All fire rows of boiler tubes are 2-inch diameter, the balance being 1¼-inch diameter. All boiler and economizer tubes are designed to allow for expansion without imposing undue stress upon the joints. The boiler drums are of Class I welded construction subjected to X-ray inspection by a 3000-volt machine. This is similar to the procedure followed in building welded drums for the U. S. Navy.

The operating pressure will be 430 pound gage and each unit will have 1830 square feet of heating surface including 780 square feet in the economizer and 1300 square feet in the air preheater. The final steam temperature is 750 degrees Fahrenheit and each steam generator is capable of producing 13,000 pounds steam per hour at normal operation and 20,000 pounds per hour maximum.

The economizers are capable of raising the feed water to 370 degrees Fahrenheit before it enters the boiler and the stack temperature will be approximately 300 degrees Fahrenheit. With a CO_2 of 14 per cent these new marine units are designed to give an efficiency of better than 87 per cent—an accomplishment that is very rare in present marine engineering experience.



SECTION AT FRAME 27
LOOKING AFT TO FRAME 10

For key to reference numbers see insert opposite Page 17.

● Soot Blowers

The boilers, economizers and air heaters installed are equipped with Diamond "Automatic Valved" Soot Blowers, which require only one operation to open and close the valve in head and simultaneously rotate the element. The automatic valved feature saves up to 50 per cent of the steam used by an ordinary valve in head blower, because the valve is open only while the element is rotating.

These soot blowers provide any required blowing arc up to and including 360 degrees. Blowing is either clockwise or counter clockwise according to the gas flow. Full or partial blowing pressure can be applied at any point of the arc; this exclusive feature protects baffles and brickwork and also saves steam. The goose neck design of the head provides unrestricted steam flow with minimum pressure drop. Positive valve closing is assured by the cam and trigger action, another exclusive feature.

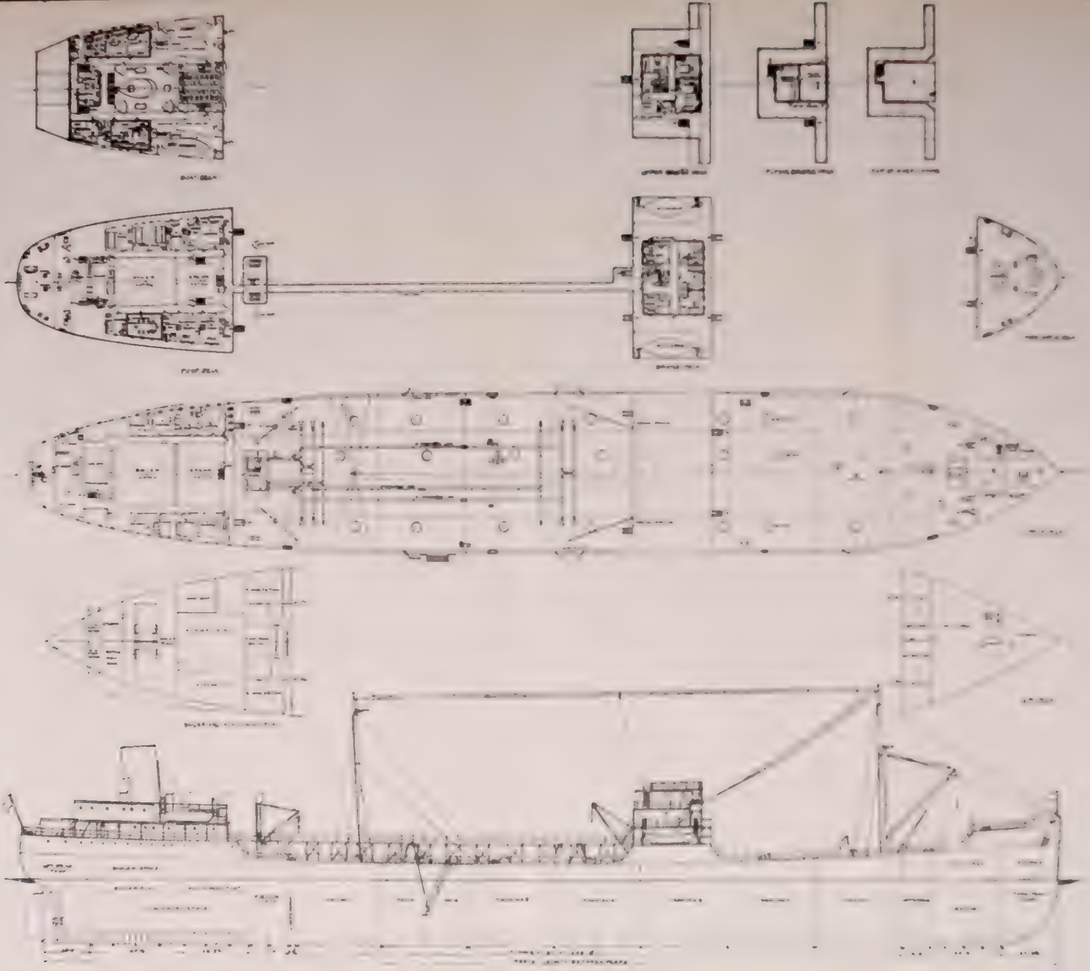


TABLE OF MAIN AND AUXILIARY MACHINERY

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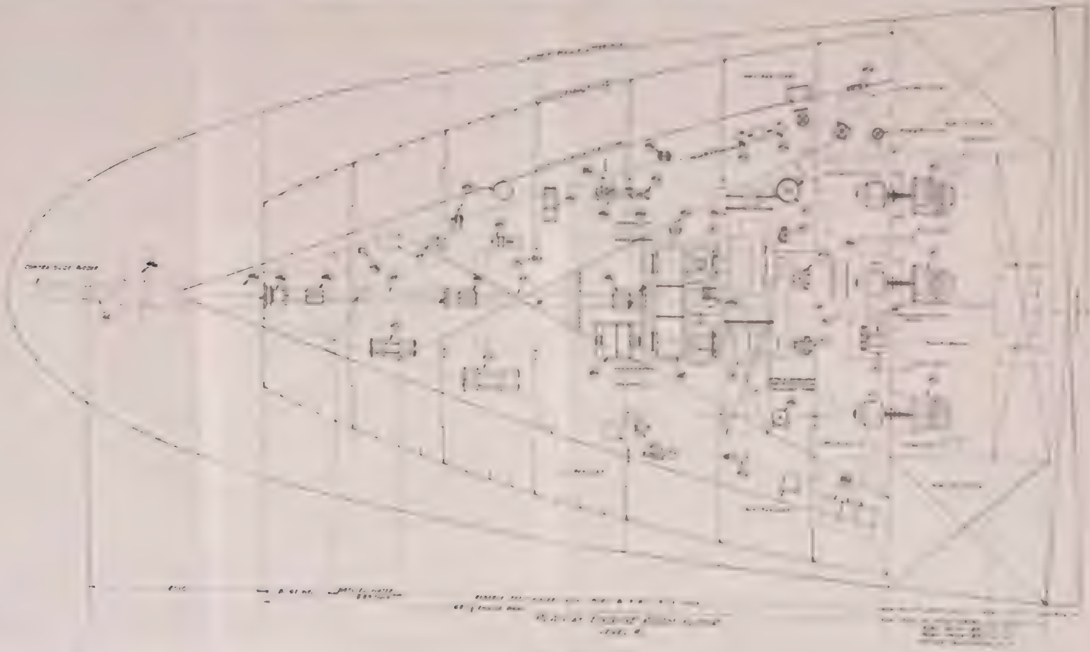
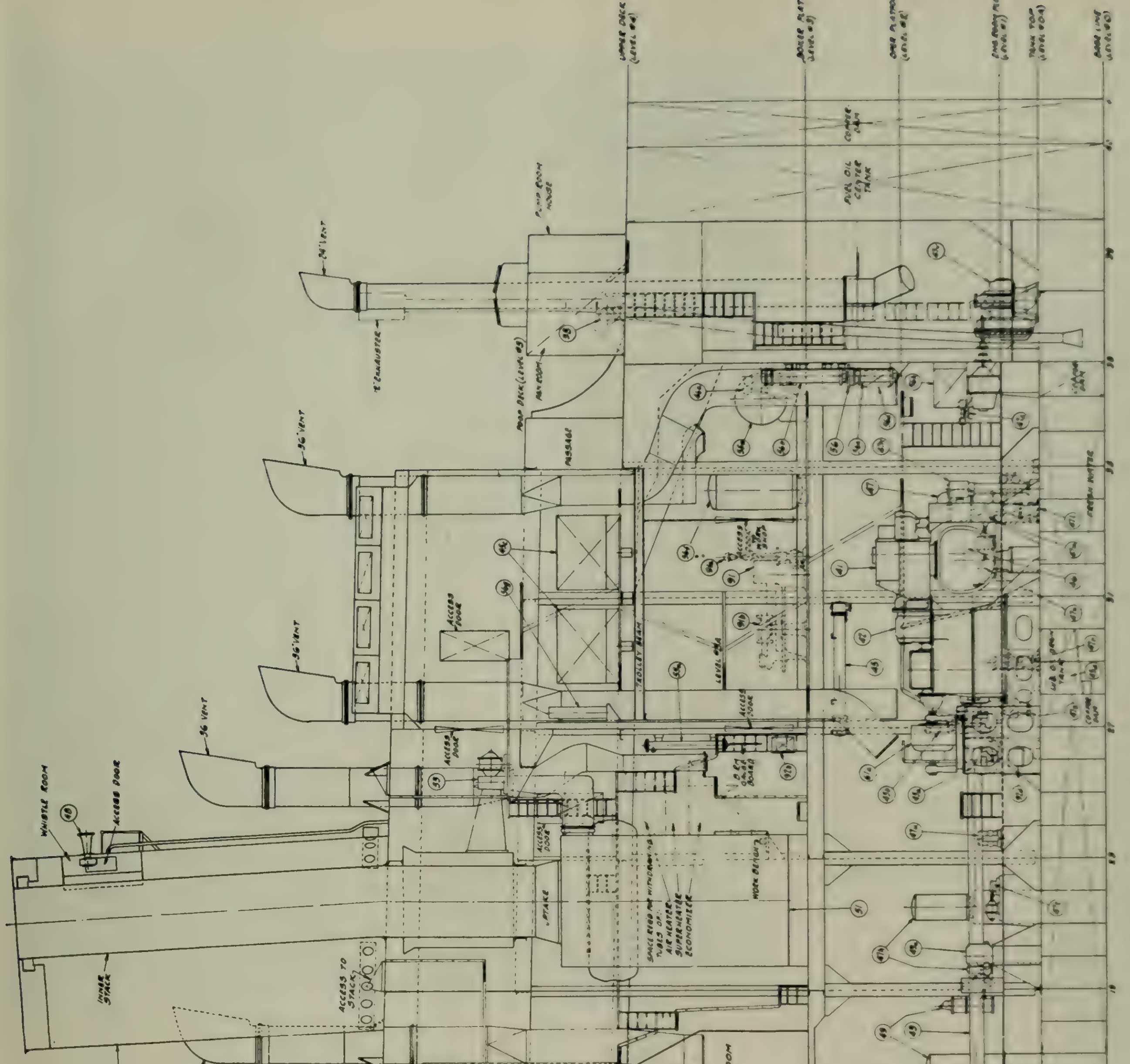
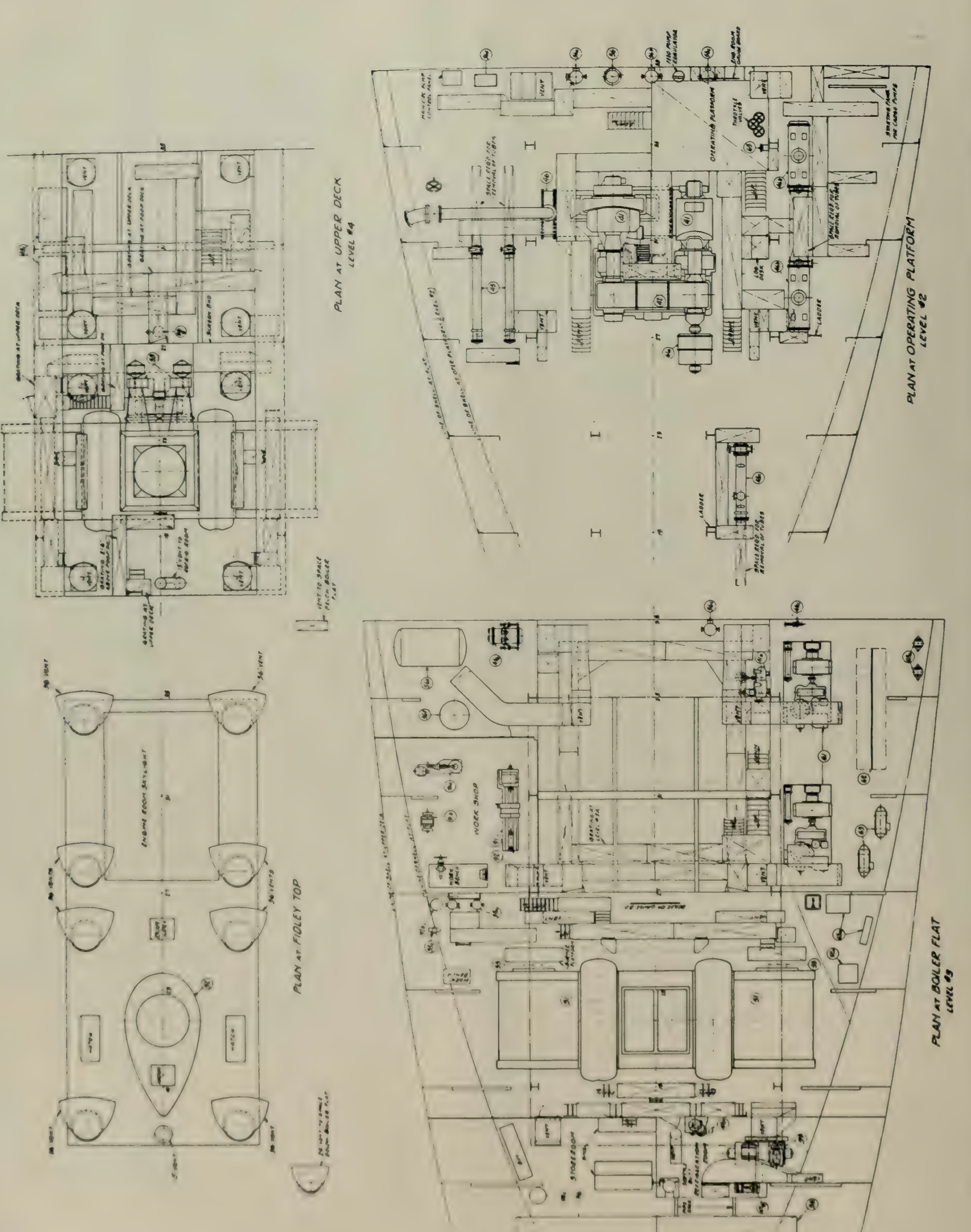
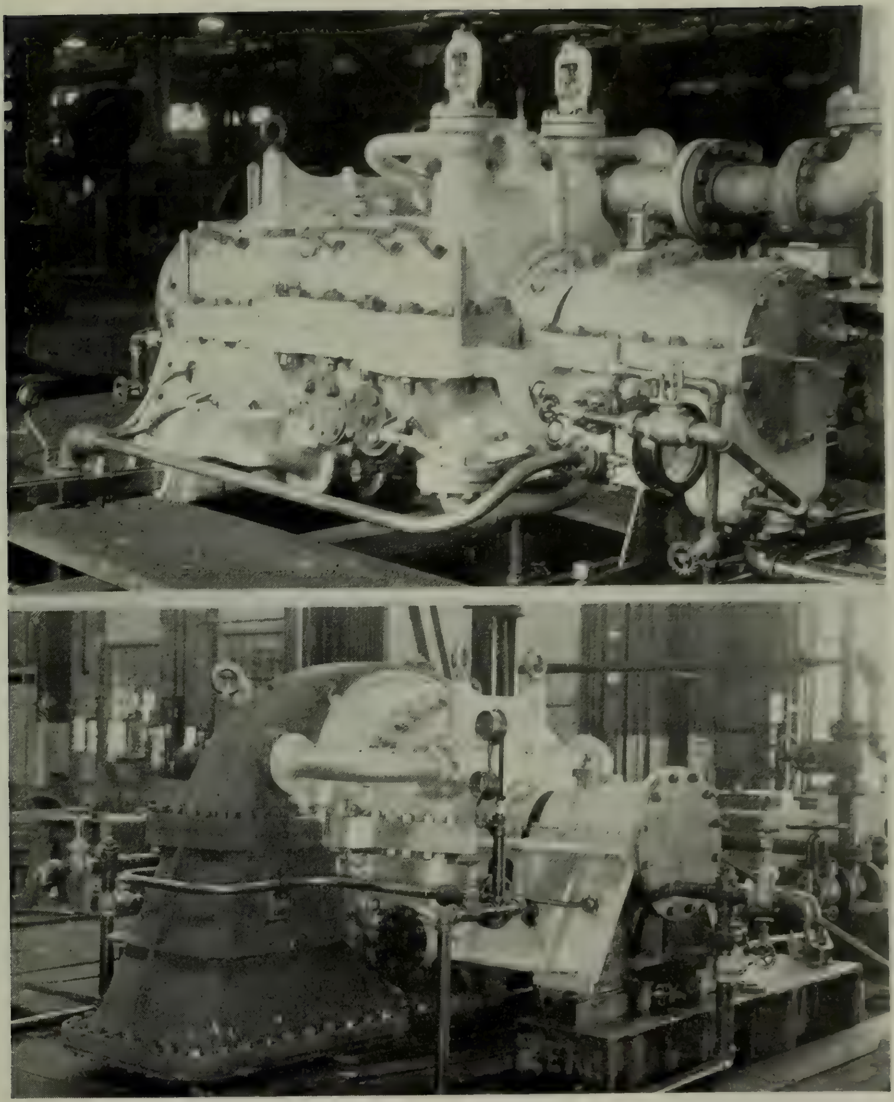




ELEVATION AT ℄ SHIP LOOKING TO PORT



Machinery arrangement plans. For key to numbers see insert facing Page 17.



Upper: The high pressure casing. Lower: The low pressure casing. Allis-Chalmers main propulsion turbines.

Calorized and Dialoy elements assure long life. Experience has proved the poppet type valve to be the only satisfactory valve for this difficult service. Seat, disc and stem are forged monel metal; seat and disc are readily accessible for regrinding without demounting head.

● Propulsion Turbines

The Allis-Chalmers cross-compound propulsion turbines built for these ships were designed for normal steam conditions of 375 pounds gage pressure, 725 degrees Fahrenheit total temperature and 28½ inches vacuum. For normal power of 3000 shaft horsepower at 90 revolutions per minute and an attached generator load of 125 kilowatts, the turbine unit delivers 3249 horsepower at the turbine couplings. For maximum power of 3300 shaft horsepower at 93 revolutions per minute and an attached generator load of 135 kilowatts, the turbine unit delivers 3568 horsepower at the turbine couplings.

In general the design of the turbines follows standard Allis-Chalmers impulse-reaction turbine design with certain modifications as required for marine applications. Simplicity of design and accessibility without sacrificing efficiency were the yardsticks used by the designers.

The high pressure turbine is of the impulse-reaction type, the rotating element consisting of one 2 row velocity impulse stage followed by 17 rows of reaction blading. The low pressure turbine is of the straight reaction type with 11 stages of reaction blading. Both the high pressure and the low pressure spindles are of the solid forged design with integral bearing shafts.

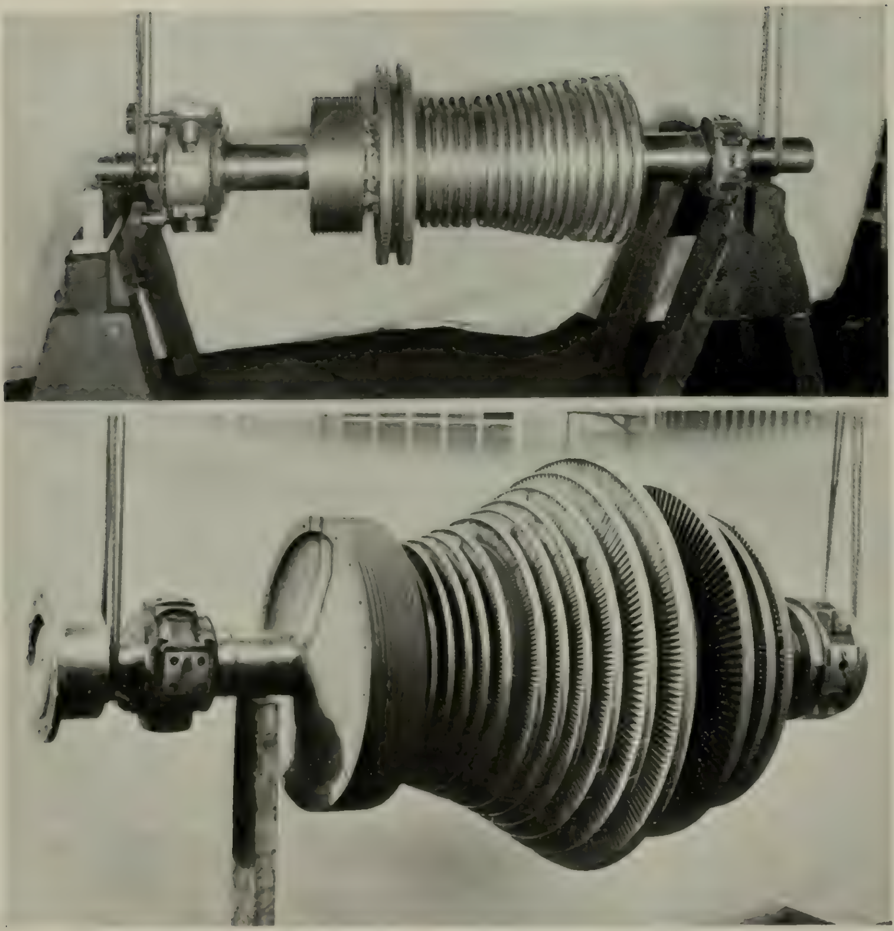
The blading used in these turbines is of standard Allis-Chalmers design. All impulse blades are milled all over from stainless steel bar stock. Proper spacing of the impulse blades is obtained by thickening the blade root instead of using individual spacer pieces. The reaction blading is made up in sections which are assembled in the blade grooves. The individual reaction blades are cut from carbon chrome nickel steel stock rolled to the exact blade shape. The blade sections are formed by holding the individual blades in jigs and silver soldering the shroud ring in place and casting on the foundation ring. This procedure insures accurate blade spacing and angularity. The use of blade sections which are accurately balanced before being assembled in the turbine insures a good running balance.

The designs of the turbine cylinders are simple and symmetrical and introduce certain features which are new to the marine field. The high temperature steam for both the high pressure turbine and the astern turbine is confined to the relatively small nozzle chests which are cast separate and welded into the cylinder shell. This means that the turbine cylinders are protected from the high temperature steam and that excessive cylinder distortions which would be obtained with the conventional marine design are eliminated.

Steam admission to the turbines up to approximately two-thirds normal flow is controlled by the ahead turbine throttle valve. From two-thirds to maximum load the flow of steam to the high pressure turbine can be adjusted by means of two hand operated valves, located on top of the high pressure cylinder. Flexibility in the steam connection to the high pressure cylinder is provided by a novel compact inlet piping arrangement welded directly to the turbine cylinder.

The combined journal and Kingsbury thrust bearing used on each turbine spindle, while new to the marine field, is a standard Allis-Chalmers design that has been very successful.

The turbines are provided with two extraction nozzles in the high pressure turbine and one extraction nozzle in the low pressure turbine to furnish steam for the evaporator, the



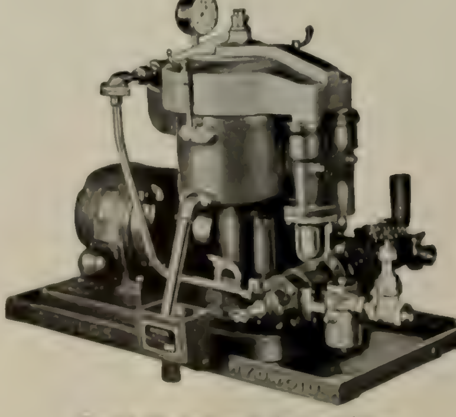
High and low pressure spindles of Allis-Chalmers main propulsion turbines.

heating system, fuel oil heating, and feedwater heating. Shaft packing glands on both turbines are of the Huhn carbon ring type. The turbines were provided with a governor oil pump which furnishes oil under a pressure proportional to the turbine speed for use on a maximum speed governor valve.

● Condenser Equipment

The main condenser is of the two-pass, de-aerating type, built by Worthington. It is installed under and takes the exhaust directly from the low pressure turbine cylinder. To take the weight of the turbine casing and to allow for expansion the condenser is mounted on spring supports. Specifications call for a total cooling surface of 3000 square feet, and ability to maintain a vacuum of 28½ inches referred to a 30 inch barometer, and with 70 degrees Fahrenheit temperature of circulating water. The shell is of welded steel plate, the heads of Wompco iron, and the tube sheets of Muntz metal. Tubes are all 70-30 cupro-nickel, ¾-inch outside diameter, and 18 B.W.G. thickness. These tubes are expanded into the tube sheets at both ends with provision for expansion. At the water inlet head a strainer is installed to prevent foreign matter passing through the tubes.

This condenser is served with circulating sea water by a vertical centrifugal motor driven Worthington pump with a capacity of 4500 to 5000 gallons per minute against head pressures of 7.7 to 11.5 pounds per square inch.



Gould Hydroil unit for purifying lubricating oil.

Two auxiliary condensers are installed. Each takes the exhaust from one of the turbines driving the auxiliary generating sets. Each of these condensers is of the same manufacture, materials, and type as the main condenser and must meet the same vacuum conditions.

● Reduction Gearing

The main transmission speed reducing gears are of the Sykes Farrel-Birmingham double helical, double reduction type with pinions arranged so that the low pressure unit of the turbines is mounted on top of the condenser. Design of all pinions and gears is such that the maximum tooth pressure will not exceed 66 pounds per inch of face per inch of diameter. The high pressure low speed pinion shaft is extended for driving through a Falk Bibby Flexible Coupling, a 125 kilowatt, 240 volt direct current Diehl generator.

The high pressure spindle of the turbine at full normal load spins 6000 revolutions a minute, and the low pressure spindle 4400 revolutions per minute. These speeds are brought down to 90 revolutions per minute at the propeller shaft by the double reduction gearing. Each turbine spindle connects to its high speed pinion through double Gearflex type flexible coupling. Each high speed gear connects to its low speed pinion through a Falk Bibby flexible coupling. A Kingsbury main thrust bearing of the segmental six shoe marine type, arranged to take thrust in both directions, is installed in the forward end of the low speed gear casing. This bearing is so proportioned that at maximum power and thrust, pressure will not exceed 300 pounds per square inch.

The line shift is in two sections, each 13½ inches in diameter, of solid forged steel with integral forged couplings, and with diameter increased in way of steady bearings. Tailshaft is 15½ inches diameter solid forged steel and is fitted with a heavy composition liner through the length of the stern tube. A heavy one piece casting of steel forms the stern tube, which has composition bushings at each end, fitted with end grain lignum-vitae bearings of a smooth working fit on the tail shaft liner.

Seventeen feet three inches in diameter, the propeller is a four-bladed, right hand, manganese bronze wheel, cast in one piece and having blades of air foil section and variable pitch with a helicoidal area of 103 square feet. Blades are to be ground and polished and a conical cast iron cap fitted over the propeller nut.

● Lubricating Oil System

A pressure type lubricating oil system will serve the main and auxiliary turbine bearings, speed reduction gears and bearings, and main thrust bearings. This system is served by one service pump and one standby pump. That for service is a Northern vertical rotary motor-driven pump with cast iron casing, bronze rotor, steel shaft and bronze glands. It has a capacity of 75 to 105 gallons per minute against a pressure of 40 pounds per square inch. The standby is a Worthington 6x7x12 inch vertical simplex steam pump of the same capacity. Two Davis lubricating oil coolers are installed, each with 185 square feet of cooling surface, and capable of handling one-half the maximum capacity of the system. A lubricating oil drain tank of welded construction with 400 gallons capacity at the working level is installed in a dry cofferdam directly under the main gear case, and is fitted with sump pots for sludge collection, with an air vent to the top of the engine room hatch, and with a float gauge. Two steel storage tanks, each of 600 gallons capacity take care of the service supply of lubricating oil.

A motor driven oil purifier of the Gould Hydroil gas-tight type takes care of impurities in the oil. A heater capable of raising 150 gallons of oil per hour from 105 degrees Fahrenheit to 150 degrees Fahrenheit, serves this oil purifier.

● Electric Generating Plant.

During normal operation at sea the entire electrical cooking, lighting and auxiliary power load will be carried by the Diehl 125 kilowatt 240 volt direct current generator which drives directly off the high pressure, low speed pinion shaft of the main propulsion turbine. This generator is provided with a voltage regulator which maintains practically constant voltage down to 67 per cent of normal propeller speed. When propeller speeds falls to 70 per cent of normal, the electric load is automatically transferred to one of the two units of the auxiliary power plant.

This plant consists of two 200 kilowatt 240 volt direct current Crocker-Wheeler generators, each driven by a De Laval geared turbine. These two generating units are arranged for parallel operation and one of them is kept idling while at sea to take the load when the ship slows down for any reason. Operating conditions for the auxiliary turbines are steam at throttle, 375 pounds per square inch pressure, 725 degrees Fahrenheit temperature, and vacuum 28.25 inches mercury.

Two rotary converters of Electric Specialty Company make are used to change the 230 volt direct current to 60 cycle alternating current at 115 volts for operation of the selsyn-motors that control the engine and docking telegraph systems and the rudder indicator. The capacity of each converter is 1500 volt-amperes at 75 per cent power factor.

Two Crocker-Wheeler 240-120 volt balancer sets are installed each of which will take an unbalanced load of 40 amperes.

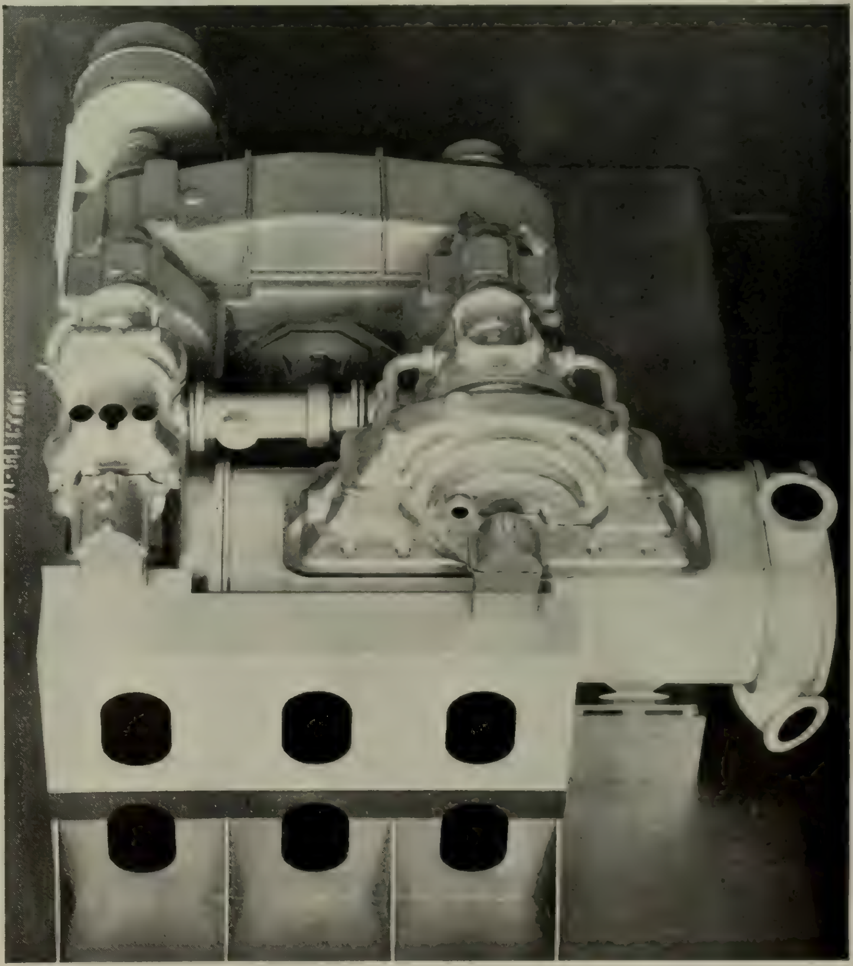
● Lighting and Communication

All lighting circuits are 115 volt direct current. Crews' quarters, machinery spaces, and all exposed locations are illuminated by lamps enclosed in water tight fixtures. The cargo pump room illumination will be from lamps in water tight bulkhead fixtures of the swimming pool type with lenses of heat resisting glass. No wiring is allowed in the cargo pump room.

Two floodlights are installed on the foremast and two on the aftermast. One 18-inch Sperry incandescent searchlight is mounted on top of the pilot house with control inside the pilot house.

A five station Henschel telephone system of the selective ringing common talking type connects the pilot house, captain's office, chief engineer's room, engine room, and steering engine room.

A Cory selsyn-motor type electric engine telegraph connects the pilot house and the engine room, with a



Model to scale showing arrangement of installation of Allis-Chalmers turbine, Farrel-Birmingham gears and Worthington condenser and Diehl generator.

12-inch double-faced illuminated dial transmitter in the wheel house and a 12-inch indicator in the engine room. The docking telegraph, of the same make and type, has two 12-inch single faced illuminated dial transmitters of the reply type, one mounted on the bridge and one on the deck aft.

Cory also supplied the electric indicators showing both the direction of rotation and the revolutions per minute of the propeller shaft. One of these is mounted at the engine room control platform and the other in the pilot house.

An electric rudder angle indicator system of Henchel selsyn-motor type transmits the helm angle from its transmitter in the steering gear room to the indicator in the pilot house.

● Wireless Equipment

Tankers R. P. Resor and T. C. McCobb are being equipped by Radiomarine Corporation of America with radio telegraph apparatus far more complete than that usually carried by ordinary tankers and freighters. These vessels will carry the most modern type vacuum tube radio telegraph transmitters.

Each vessel will have three transmitting sets, thereby covering all the frequency bands generally used in marine service.

R.C.A. three-unit radio transmitter, covering all frequency bands used in marine service.

Latest type R.C.A. radio direction finder.

Model ET-3626C is the type used for intermediate and low frequencies. The Model ET-8002C is a powerful high frequency long range transmitter. In addition to the above two transmitters, a special type of auxiliary transmitter — Model ET-8003— operating from either the ship's main power supply or a twelve volt storage battery, will be provided.

Receivers capable of covering the intermediate, low and high frequencies of the radio telegraph bands will comprise the receiving installation.

With such equipment, these vessels will be provided with communication facilities such as to enable them to communicate with their home offices, regardless as to distance or location.

In addition to supplying this most complete radio telegraph installation, these vessels are also being fitted with the latest type RCA radio direction finders—Model AR-1445C. Through the use of this instrument the masters will be able to quickly determine their exact positions by taking bearings on one or more of the numerous beacon stations maintained by the U.S. Government and other leading maritime powers. This precision navigation instrument enables the navigators also to quickly and accurately determine the positions of other vessels.

Through the worldwide facilities of the coastal stations of the Radiomarine Corporation of America, these two vessels will maintain constant and direct communication throughout any voyage which they may be called upon to undertake.

● Cargo Pumps and Piping

Three cargo oil pumps of the Northern horizontal rotary type are installed in the pump room located amidships between the two wing fuel oil tanks, and immediately forward of the engine room forward bulkhead. Each of these pumps has a capacity of 1335 gallons per minute against a total pressure of 105 pounds per square inch, and each is driven through a Farrel-Birmingham reduction gear by a Crocker-Wheeler direct current motor. The driving motors are located in the engine room, with shaft extension through a stuffing box in the bulkhead. Control of mechanism for these motors is located in the deck house over the pump room, with an auxiliary start-stop switch at each motor.

Each pump has four suction connections and four discharge connections: the suction connections are: to a 10-inch line from the sea connecting at each side of the ship; to 12-inch lines from all center tanks; to 8-inch lines from all wing tanks; and to 6-inch stripping lines from all tanks. Discharge connections comprise: 10-inch overboard through the sea suction lines; 10-inch to all tanks; 8-inch to deck lines; and 10-inch to deck lines.

● Tank Cleaning System

The Butterworth tank cleaning system will be installed. This system consists of a saltwater heater located in the engine room and connected to the fire main and to one or more portable Butterworth machines. Each cargo tank has one or more special manholes arranaged to accommodate one of these machines which is a special type of oscillating spray nozzle. The fire pump drawing sea water discharges it through the heater into the fire mains at a pressure of 200 pounds per square inch and a temperature of 180 degrees Fahrenheit. The Butterworth machine is inserted through the manhole and connected by a section of a special high pressure hose to the nearest fire main outlet.

This system has given very satisfactory results in a number of tankers and is fast becoming American standard practice for tank cleaning.

● Windlass and Steering Gear

The windlasses and steering gears are of the Hyde Windlass Company's make.

The windlass is of the spur geared type driven by electric motor self-contained on same base plate. The two wildcats on windlass were designed for handling 2⅛-inch cast steel chain; each wildcat has independent locking gear and brake band controlled by means of hand wheel. Large warping gypsies are fitted on ends of intermediate shaft. The electrical equipment consists of a marine type motor fitted with a shoe type brake. The control consists of a water tight master switch and a magnetic panel.

The steering gear is of the hydro electric type and consists of a cast steel tiller for rudder stock working in a swivel bearing supported in the double plunger. The two hydraulic cylinders and plunger are self-contained on one base plate. There are two power units; each consisting of a constant speed motor directly coupled to a variable stroke pump which forces oil through tubing under pressure of around 800 pounds to the cylinders of steering gear. A set of valves at each pump provides means for quick change-over from one pumping unit to the other. The steering gear has automatic control with an emergency wheel at the steering gear as well as the usual wheel at pilot house and bridge stations.

A Brown type hydraulic telemotor serves as a means of transmission between the steering stations forward and the steering gear. The telemotor transmitter is located in pilot house fitted with steering wheel and the receiver aft at steering gear connected to the automatic follow-up. There are two lines of copper tubing about ½-inch diameter which extend from forward aft connecting the telemotor transmitter to the receiver cylinders. This telemotor system is charged with a mixture of water and glycerin, or telemotor oil.

● Deck Winches

Three Lidgerwood winches are used, one forward, one amidship and one aft. Each winch is capable of lifting a load on either winchhead, but not simultaneously, of 16,000 lbs. at 40 feet per minute.

Each winch has two winchheads 20 inches diameter, 20 inches face, with 24-inch diameter flanges. These winchheads are of cast iron with cast whelps, keyed to the winch shaft. The winch shaft is of special high carbon steel, accurately machined and supported in bronze bearings.

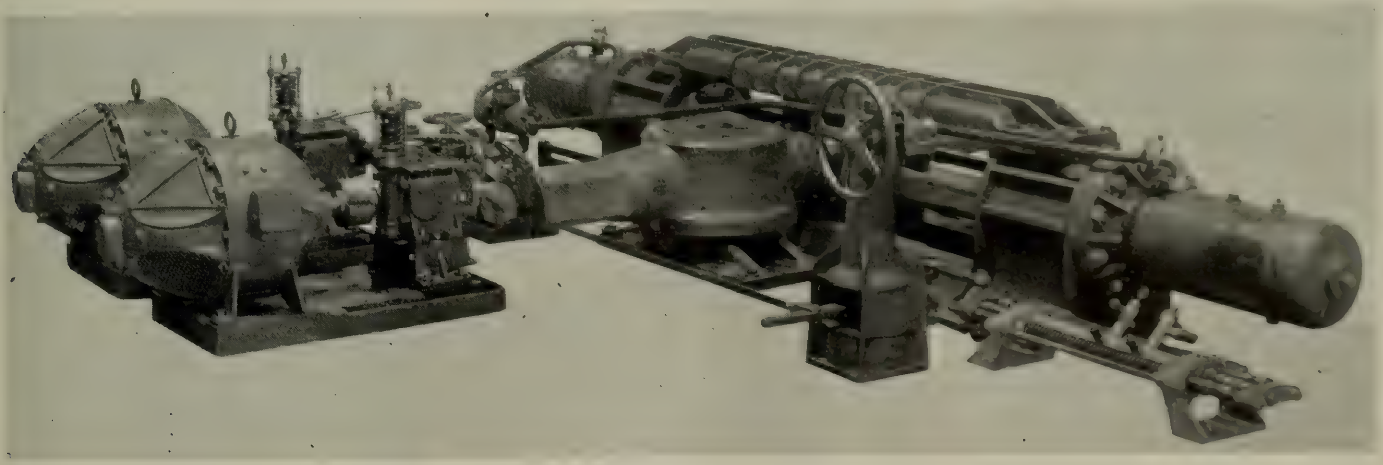
There are two gear reductions between the electric motor and the winchhead shaft, with the gears of cast steel and the pinions of forged steel, all gearing having machine cut teeth. All gearing is totally enclosed in an oil tight housing, the lower part of the housing being cast integral with the bedplate and supporting the winch shaft and intermediate shaft bearings. This housing, together with the bedplate, is of special cast iron. The housing cover is of cast iron bolted to the housing and equipped with hand hole covers for insertion of lubricant and inspection.

The electric motors are 25 horsepower, 230 volts, direct current, Type TE, watertight. Each motor is fitted with a watertight solenoid brake. The drum controllers are watertight, reversing with five points in each direction. The protective panel is dripproof with jam relay, overload and low voltage protection. The motors were manufactured by the Diehl Manufacturing Company, and the brake and controls by Cutler Hammer Manufacturing Company.

All of the wiring, piping and fittings are of the highest grade materials and are inspected carefully to meet the rigid specifications of the Standard Oil Company. All valves on the oil lines are Crane Double Disc Gate Valves of the standard iron body, brass mounted, flanged end type with hand hole clean outs. These valves are rated for 200 pounds per square inch pressure, cold oil. A car load of 6-, 8-, 10-, and 12-inch sizes of this type valve was used on the two tankers.

● Officers' and Crews' Quarters

Captain's suite (office, bed room, and bath) is located on the upper bridge deck. The erection on this



Hyde electro-hydraulic steering gear for tanker R. P. Resor.

deck houses also the radio room, radio operator's bedroom, and master gyro compass room. On the bridge deck immediately below are rooms for the first, second, and third officers, a bathroom and two spare bedrooms for owner and or guests.

On the boat deck aft are: an office and a bedroom for the chief engineer; bedrooms for first, second, and third assistant engineers; a bedroom for the steward; two wash rooms, a bath room, and a hospital.

On the poop deck below are: the ship's galley and pantry; mess rooms for the officers, the petty officers, and the crew; two wash rooms each with toilet and shower; and four bedrooms for, four boys, two cooks, a pump man and a boatswain, and an electrician and a machinist.

On the upper deck below the poop are located: the steering gear compartment; a compartment for stores; two insulated compartments for refrigerated meats and provisions; eight bedrooms to accommodate four firemen, three oilers, three wipers, and twelve seamen; a crew's shower room; and a crew's toilet room.

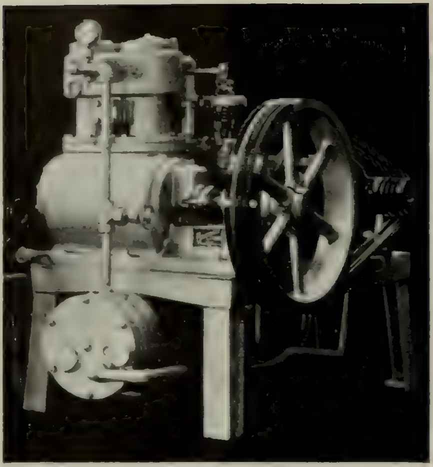
This accommodation is all furnished and equipped in neat substantial comfort. Everything necessary for the convenience and physical well being of the officers and crew is provided. Especial attention has been given to the problem of arrangement, location and equipment to produce maximum comfort combined with safety from fire and with a high degree of sanitation.

All furniture is of metal, all doors are hollow panel metal doors, all plumbing fixtures are of the best quality Crane Company manufacture. Electric fans and natural ventilation are both employed to force an abundance of fresh air through all the rooms.

● Fireproof Bulkheads and Ceilings

In arriving at materials to anticipate proposed regulations relating to fireproof construction, it was recognized that features beyond mere fire resistance merited attention.

Insulation, both thermal and sound, resistance to normal abuse and capacity for decoration were all obviously desirable. Immunity to continued high humidity and satisfactory stiffness, as well as mechanical strength to meet the vibration and working of a ship, were definite requirements.



Carrier self-contained ammonia refrigerating unit as installed on R. P. Resor.

For cabin bulkheads and passageway enclosure, the builders selected a panel composed of a 1-inch thick vitrified and waterproofed asbestos core, as manufactured by Johns-Manville which was faced with No. 26 gauge galvaneal steel and furnished as completed panels, cut to size, by the Haskelite Manufacturing Corporation. The weight is about four pounds per square foot.

Ceiling panels with the same core but veneered with 1/16-inch asbestos flexboard, in lieu of the steel and weighing about 3.0 pounds per square foot, were made and furnished by Johns-Manville.

Where changes in plans necessitated it, panels were cut to exact size on the job. All edges were sealed, the panels covered with decorative steel battens.

Panels, with both steel and asbestos flexboard finishes were tested under the N.F.P.A. Recommended Regulations for Marine Construction exceeded the one hour test for integrity of structure, as well as meeting requirements of temperature rise, under the standard A.S.T.M. 1700 degree cure. Strength tests were made, as well as tests to determine the necessary immunity to prolonged high humidity and to the effect of rapid changes in temperature in coming from southern to northern waters.

Sound transmission indicated a considerable greater resistance, or sound isolation, than with an equal thickness of plywood. To show the thoroughness with which Hopeman Brothers studied the problem, tests were made to simulate a steam leak in proximity to a panel, so as to establish the adhesion of the facing material to the core under such a condition.

From the standpoint of comfort, aside from being fireproof, the quarters are superior to those of passenger vessels embodying wood or other organic panels with equally attractive appearance for the same veneer or finish selected.

● Refrigerating Equipment

The ship's stores refrigerators consist of a two-compartment box, divided approximately in half. One compartment is designed for the storage of frozen meat at a temperature of 20 degrees to 24 degrees and the second compartment is arranged for storing perishable products, such as vegetables, fruit, etc., at a temperature of approximately 40 degrees. In addition, a water cooler is provided to supply chilled drinking water throughout the vessel at all times.

The refrigeration is effected by means of a Carrier Self-Contained Ammonia Refrigerating Unit. This unit is of a very compact design. The base is especially arranged so that the compressor and motor are mounted on top and a condenser, of the shell and tube type, is mounted underneath. Four substantial legs permit securing the entire unit to the deck without the necessity of constructing special foundations. A minimum of deck space is required and the necessity of furnishing special brackets, hangers and foundations, usually considered as part of refrigerating installations, is entirely eliminated.

Cooling in the refrigerated compartments is effected by means of extra heavy galvanized steel coils properly valved to permit individual temperature adjustment.

A constant supply of cooled water is available in various parts of the ship for the comfort of the crew, the water being supplied from a water cooler also connected to the refrigerating plant. This added comfort and convenience has proved to be very beneficial and a decided factor in increasing the efficiency of the crew, particularly while the vessel is in warm or tropical climates. The entire system is of substantial design with moderate operating speed, in accordance with the usual rigid requirements as set forth by the Standard Shipping Company.

Speed Reduction Gearing for Ship Propulsion Turbines

By W. W. Smith*

Chief Engineer, Federal Shipbuilding & Drydock Company

In American ships, both merchant and naval, the geared-turbine has practically displaced the turbine-electric drive and the diesel engine. Substantially, it is the engine of the present, and promises to be of the future. For this reason, the reduction gear has recently assumed greater importance. Therefore, the improvement and refinement of gears is fully justified, and should receive particular attention.

The trend is to higher steam pressures and temperatures. For such conditions, it is important to use high-speed turbines so that their size will be small; thus reducing to a minimum the structures subjected to high pressure and temperature; and resulting in increased reliability and efficiency. In view of the marked advantages of high-speed turbines, it is believed that they will come into general use. High-speed turbines require double gears, and result in high tooth velocities of the high-speed pinions. Present gears operate at velocities around 200 feet per second, and higher velocities may be expected in the future. In view of these prospects, the great importance of high-precision gear cutting and manufacture is evident.

The precision methods described in the paper are of high order, and fulfill the exacting requirements of high-speed gearing. The meticulous care, which is exercised to insure precision, is indicated by the extent and refinement of the processes used for machines, cutters and product. Since it can be obtained, marine engineers, who desire good gears, should accept no less precision than given in the paper.

It is generally known that much of the past gear trouble, and particularly in early gears, was due to inaccurate gear manufacture. In this respect, much progress has been made; but, present practice generally can be and should be further improved.

Cutting the gears horizontally, the small effect of temperature, and the fine finish on the teeth are considered particularly important with respect to the accuracy and smooth operation of gears; especially, of high speed gears. The absence of space between the helices gives a shorter and stiffer pinion, which results in a more compact gear unit. In general, it appears that the Sykes process is a step in advance over the hobbing method.

A large diameter is advantageous for the gears of merchant ships. With double gears, a large main gear wheel is generally required to obtain a compact and good arrangement of the turbine unit, including turbines, gear, thrust bearing, condenser and foundations. The general desirability of using a relatively large gear wheel with a narrow face and two-bearing pinions is more or less established.

It is desirable to use welded construction for the gear case in preference to cast iron. Also, it is important to use welded construction for the foundation. Both gear case and foundation should be exceedingly rigid; and, much more so than is usual in practice.

Gear wheels are very large structures relative to the accuracy required for the meshing teeth. Distortions which are small relative to the wheel are larger relative to the teeth. Therefore, to avoid distortion, wheels should be stress-free structures, or practically so. Rims which are shrunk on cast iron centers with heavy forces cause stresses which are undesirable because of the distortion which results. For the same reason it is undesirable to press shafts into gear wheels with heavy forces. It is desirable to make the high-speed gear a single stress-free structure by using a forging, or a welded structure, in which the shaft is integral with the wheel. For the low-speed gear, it is desirable to use a stress-free structure of welded construction, in which, the shaft is integral with the wheel, if possible; or, separate, if necessary.

COMPARISON BETWEEN SYKES AND PREVIOUS GEARS

1—General:		
Installation	A.	B.
Ships	G. H. Smith W. S. Farish	R. P. Resor T. C. McCobb
Shaft horsepower	4,000	3,000
2—Revolutions (R.P.M.)		
Propeller	75	90
Turbine, high pressure	5,480	6,000
Turbine, low pressure	4,270	4,400
3—Space and weight. Total		
Length, ft.	13.0	7.2
Floor area, square ft.	195	87
Volume, cubic feet.	2,340	730
Weight, pounds	160,000	74,300
4—Space and weight per S.H.P.		
Length, feet/1000 S.H.P.	3.25	2.4
Floor area, s. ft./1000 S.H.P.	49	29
Volume, cu. ft./S.H.P.	.59	.31
Weight, lbs./S.H.P.	40	24.8

Harder materials would permit increase in tooth pressure. It is particularly desirable to increase the tooth pressure of the main gear so as to reduce the size and weight of the gear unit. To effect this important saving, the development of harder materials would be well worth while.

In two tankers which are now being built at the Federal yard, the main gears are of the Sykes type. Due to the absence of space between the helices, the integral arrangement, the higher revolutions, and the higher tooth pressures, the gears are very compact; the space and weight being considerably less than for previous gears. The table herewith gives a comparison between these gears and the ones installed on the G. Harrison Smith and the W. S. Farish. For the values per shaft horsepower the Sykes gears referred to the previous gears as unity are as follows:

Length	.74
Floor Area	.58
Volume	.53
Weight	.62

Approximately, the space and weight of the Sykes gears are two-thirds of the previous gears, which is an important step in advance.

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*Abstract of a discussion of a paper by W. E. Sykes before the 43rd annual meeting of the Society of Naval Architects and Marine Engineers.

Marine Applications of
Nickel and Nickel Alloys in 1935

By Robert C. Stanley
President, International Nickel Company

At sea, as on land, the problem of reducing deadweight received growing recognition. Because of the corrosive action of salt water, rust is a real problem in maintaining essential factors of safety. Thus the desire to reduce weight through use of thinner sections has stimulated interest in monel metal, stainless steel and other nickel alloys for many shipboard installations.

Among the developments in this connection was the introduction of monel metal water tanks for lifeboats. Several large steamship companies adopted a general policy of making such replacements. Even small boat owners evidenced interest in this development, and for the first time monel metal tanks for both fuel and water were made available for yachts and small cabin cruisers.

Monel metal was also employed for various parts of ship-board power plants exposed to contact with salt water. Increased corrosion resistance and a saving of approximately 35 per cent in weight were effected through the use of welded condenser heads made of monel metal sheet. Purity of boiler feed water was increased by the adoption of surge tanks similarly constructed.

"K" Monel wearing sleeves on shafts of centrifugal pumps and cast "S" Monel valve trim for vital parts in the heads of soot blowers came into general use.

In boiler settings, Inconel anchor bolts have been adopted for holding refractory fire brick in wall construction.

The present trend in the marine field is to circulate boiler feed water, steam and condensate in a closed system. The desirability of minimizing contamination from corrosion has led to the consideration of corrosion resistant materials for storage and deaeration tanks of the boiler feed water system. Monel metal has been chosen for this and was installed in several vessels built and building. Lightness was sought through the elimination of allowance for corrosion during the life of the tank, and it was possible to use plate only one-half as thick as the carbon steel formerly used. The need for painting the inside of the tank was also obviated.

Such an application suggests interesting industrial uses outside the marine field, wherever cleanliness of water in an enclosed system is desirable.

Also to reduce weight, monel metal has been employed for the water chests or heads of marine condensers in several vessels built or building. This application required the development of a special technique in handling 3/16-inch monel metal plate by coppersmithing methods to obtain intricate shapes.

Pump designers and operators have been led by experience to seek corrosion resistant alloys and greater hardiness for pump rods, sleeves and bushings. A number of large boiler feed and main circulatory pumps for ships have been built during the past year, using "K" Monel for pump rods and bushings.

Increasing use of cupro-nickel alloy for condenser tubes, a standard application for marine service in Europe and the United States, was observed during 1935.

Copper nickel condenser tubes may be of either the 70 copper-30 nickel alloy or, in some cases, 80 copper-20 nickel. Several vessels are being built with pipe line of the 70-30 alloy to handle circulation of salt water. Practical experience confirms laboratory investigation and indicates exceptional life for the alloy when exposed to natural waters.

Progress was made in 1935 in employing the 70-30 alloy for castings for valves and fittings.

The wide use of nickel for marine purposes is illustrated by the Normandie. This French liner has nickel-chromium steel turbine and blading, 2 per cent nickel steel for bolts and studs on high pressure superheated steam lines and 5 per cent nickel steels for expansion joint fittings. The shafts are of nickel-chromium steel. Chromium nickel stainless steel of the 18/8 type was used for decorative fittings, hardware and finishings, including bath fixtures, mouldings, lighting fixtures, beds, modern furniture, galley equipment, metal ware, railings and the name on the bow in letters three feet high. Nickel silver was used for plumbing fixtures and allied items. Monel metal went into valve trim, turbo-feed pump blading, discs and valves, refrigerator trim, etc. Auxiliary condenser tubing was made of 70-30 cupro-nickel. Nickel alloys will be used extensively in several ships now building or soon to be built in France.

During the year a large hollow nickel-steel wheel shaft was forged for the stern paddle wheel of the steamboat Sprague, now plying between Baton Rouge and Memphis on the Mississippi River and said to be the largest river steamboat in the world. The paddle wheel shaft was of 3¼ per cent nickel steel, hollow forged. Its shipping weight was 78,305 pounds; overall length was 47 feet 2 inches, outside diameter 31 inches, and inside diameter 21 inches.

Nickel cast iron is also finding applications in marine construction. One of these was the world's smallest outboard motor which develops 3.7 horsepower at 4000 revolutions per minute, though it weighs only 37 pounds. Ni-Resist sleeves are used in the aluminum cylinder block.

Small boat owners continued to show an increasing interest in the use of monel metal shafts. One of the outstanding examples was the racing motor boat El Lagarto, winner for the third time in succession of the Gold Cup.

Exhaust Temperatures Important

By Charles B. Graves*

Useless as the exhaust of an oil engine may seem to the average layman, we find that it is the pulse from the heart of the diesel.

The exhaust of diesel engines of three hundred horsepower and up can be used today to operate exhaust turbines and they in turn can be direct connected to a blower. Air can thus be raised to a pressure of from 2.5 pounds up to 7 pounds per square inch, and may be used either for supercharging a four cycle engine or for scavenging and/or supercharging a two-cycle engine.

Supercharging an engine can increase the mean effective pressure by up to 30 per cent, and that means increase of power without increasing the size of the engine.

The scavenging pump of a two-cycle engine absorbs from 8 to 10 per cent of the power of the main engine. Therefore, by using an exhaust turbine blower the effective power output may be increased by ten per cent.

Exhaust gases can be used either directly or after passing through a turbo blower in generating steam with an exhaust boiler. In most modern diesel ships the exhaust is passed through a boiler and the steam generated (at pressures up to 125 pounds per square inch) is used in steam turbines or engines for driving electric generators. By this means, the exhaust from large marine diesels can be made to generate enough electrical energy to operate all of the auxiliary equipment on the ship. With new modern exhaust boilers three pounds of steam can be generated per brake horsepower developed by the engine.

Outside of all this usefulness of the exhaust there is the still more important use of exhaust temperatures as indicators. By the use of a good pyrometer the engineer can dial any cylinder he desires and get the history of what is going on inside of that cylinder. This history can be obtained while the engine is running at full power load.

● A Drop in Temperature

A drop of a few degrees from normal running temperatures will indicate loss of compression or poor atomization of fuel, such as too little fuel passing through the injection nozzle. This may be caused by dirty injection nozzles, by carbon formed on the tip, or by the fuel oil strainers to the injection pumps becoming dirty and starving the pumps.

In an air injection system, when the air pressure drops, proper atomization does not take place and temperature will drop. Also, the intake or exhaust valves may be sticking or a general grinding be needed. Intake valve trouble may be detected by the blowing of exhaust gases into the air intake manifold. Loss of compression may be due to broken piston rings or rings being stuck with excess carbon in ring grooves, or can be caused by the wear of the crank pin bearings or main bearings or crosshead bearings. Engineers, when taking up slack of bearings should remember that the piston has been dropped by the wear of the bearings and should check loss of compression by readings of the pyrometer.

The wear of moving parts (such as timing gears to the camshaft and lay shafts) or poor lubrication will have a tendency to retard the timing of the fuel pumps. Fuel nozzles operated by cam rocker arms will increase or decrease the opening of the fuel injection nozzles periodically. Also the exhaust valves and intake valves push rods may be out of adjustment. All of these troubles will cause a drop in exhaust temperatures.

● Temperature rises.

Climatic conditions will cause engine room temperature to rise but it is a steady rise and equal in all cylinders of the engine. A sudden rise may be caused by hot spots, or in other words, carbon on the pistons or cylinder heads, resulting in too much carbon in the cylinders. These hot spots are caused by the carbon becoming red hot on one spot and that is one of the frequent causes of cracked covers and piston heads. Or a sudden rise is sometimes caused by the faulty circulation of the cooling mediums in the pistons or heads or jackets, mostly piston heads.

Pistons using oil for a cooling medium must be kept under very close observation due to the fact that the oil coming in contact with the hot piston head will cause carbon deposits on the under side of the piston head. This will hinder the radiation of heat through the piston heads and cause a rise in temperature that may result in a cracked piston. Fuel pumps and injection nozzles admitting excess amounts of fuel oil will raise the temperatures.

The compression for individual cylinders can be determined very closely after the bearings have been adjusted and should too many shims be added when jumping the compression up for wear of bearings a temperature rise will be noticed, caused by too much compression.

Cooling systems using sea water or running water from a deep well or river will cause plenty of trouble after runs of 6 to 8 months if the water contains such great amounts of mineral matter as to form incrustations preventing the water from coming in contact with the metal of the cylinder walls and heads. When this happens, the temperature will rise above normal. This being discovered and not taken care of, cracked liners and cylinder heads will occur. This trouble can easily be avoided by circulating in the cylinder liners and heads a special solution which can be bought in the open market. This solution will dissolve the incrustations very readily if kept in the engine 24 hours. Cooling water passages should be thoroughly washed out after this treatment.

All modern diesel engines have thermometers in the cooling system inlet and outlet of each cylinder. Also in the inlet and discharge of the lubricating oil for the main bearings and crank pin bearings, and piston cooling systems whether oil or water. With these the engineer, after he has read the exhaust pyrometer, can check up all the various temperatures and determine the reasons for the rise or fall in the heat content of the exhaust.

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*Instructor of Diesel Engineering, Oakland Central Trade School.

Should the lubricating oil be of poor quality and burn up in the cylinder as fast as it is pumped in, or should the fuel oil be of a high B.t.u. content or high volatile structure, there will be a rise in temperature in all cylinders at the same time. Better lubricating oil is indicated for the former condition and injection nozzle adjustment for the latter.

When the cooling system is of the closed type and some unit of the system fails to do its part in keeping the circulating water cooled to its proper temperature, then the rise in temperature will be the same for all cylinders.

To install a diesel engine of any size, type or make without its proper thermometers and an exhaust pyrometer is like installing a modern steam generator in a ship without control of stack gases. The reason so many diesel plants are expensive to operate is because the engineer has nothing to tell him where to look for trouble.

The exhaust temperatures of four cycle engines vary according to the bore and stroke of the engine. For small engines the temperature averages 675 to 700 degrees Fahrenheit, and for large engines with a bore of 12 inches up from 700 to 750 degrees Fahrenheit. For two-cycle, semi-diesel engines, the average exhaust temperature is 450-500 degrees Fahrenheit and for 2-cycle full diesel type 600 to 650 degrees Fahrenheit due to the cooling effect of the scavenging air. All this information may be obtained when the engine is bought from the factory.

One chief engineer of a diesel passenger liner of 16,000 horsepower, ten years old, says, when I go down to the engine room I care to look only at the exhaust pyrometer, as that will tell me all the history of my engines at a glance. Today, his ship, according to Lloyds of London, has the smallest maintenance cost of any ship in the world service.

An Efficient Oil Separator for Bilge and Ballast Water

It is an old saying that "an ounce of prevention is worth a pound of cure," and this was well exemplified by the Bethlehem Shipbuilding Corporation's Oil and Water Separator, which demonstrated in operation at the Marine Exhibition of the Maritime Association of the port of New York last month how simply and efficiently oil pollution of harbor and coastal waters can be positively avoided.

This equipment was designed and built to separate or remove the oil from the oil water in the bilges and fuel tanks filled with ballast water, so that the overboard discharge from such compartments will not contain more than five hundredths of one per cent of oil as prescribed by the Federal regulations. The Bethlehem —L. J. Oil Separator goes further by guaranteeing to meet the requirements of the U. S. Navy Department which specifies that the overboard discharge must not contain more than one hundredth of one per cent when passing through the separator an oil and water mixture containing not less than three per cent by volume of Bunker "C" oil at the rated capacity of the equipment.

A corner of the exhibit of the Bethlehem Shipbuilding Corporation at the New York Marine Show featuring the Bethlehem L. J. Oil Separator.

The unit shown in our illustration has a capacity of five tons of oil and water mixture per hour and is one of the smaller sizes manufactured by Bethlehem for handling discharge from bilges. It is fitted with a sump tank, formed by extending the shell about twelve inches below the bottom head of the separator and welding thereto a flat plate.

Drains from the test cocks, which are fitted at different levels to show the accumulation of oil in the upper part of the separator, are led to the sump and by means of a small ¼ horsepower motor driven pump the contents of the sump are discharged back into the inlet mixture line.

This arrangement avoids fouling the bilges of the compartment in which the separator is located, which would be the case if the sump tank was omitted and the drains led back to the bilge.

For marine service these separators are made in standard sizes from 3 tons per hour to 100 tons per hour capacity and at the purchaser's option, are furnished with or without sump tanks.

This Bethlehem equipment, as the illustration indicates, takes up very small space and as it is operated as a closed system under pressure, it can be located down in the engine or boiler room where its operation can be readily observed.

These separators, with their almost uncanny separation of the oil from bilge and ballast water, and discharging clean water overboard, provide a solution of the oil pollution problem, at least so far as it is aggravated by oily discharges from ships while at the same time the oil saved is returned to the fuel tank for future use.

Some 1935 Marine Electrical Developments

By H. C. Coleman

Manager, Marine Electrical Engineering Westinghouse Electric and Manufacturing Company

A review of the shipbuilding activity during 1935 reveals a continuation of the same situation which existed through 1934 and the last half of 1933, namely, a woeful lack of merchant marine construction but a welcome building program of considerable extent sponsored mainly by the Navy Department and to a slight degree by other Government branches. Because of this state of affairs, the largest and most important advances made in the actual installations of electrical apparatus for marine purposes have been in connection with naval work and therefore of a confidential nature.

The Diesel electric system of propulsion continued to find favor in the field of small vessels. Early in 1935, the U.S. Public Health Service commissioned for duty at the Rosebank Quarantine Station, New York, its new inspection and fumigating vessel W. H. Welch. Unusual care was taken in the construction of the vessel both from hull and machinery standpoints. The entire hull and superstructure is of pure wrought iron and the propulsion machinery is of the diesel electric type.

The propulsion plant includes two engine generator sets, each consisting of a 205 kw., 250 volt main generator and a 25 kw., 125 volt exciter, direct connected to a 360 rpm., Fairbanks Morse, 7 cylinder engine. The two main generators furnish power to a 500 hp., 250 rpm., double armature motor which is direct connected to the propeller. The conventional variable voltage control system is used, with both pilot house and engine room stations. The control board is of the latest compact cubicle type. The exciters furnish the power for separate excitation of the main generator and motor fields as well as power for all auxiliaries and lights. This vessel is a sister ship of the Walter Wyman, which was commissioned in 1932 and had a similar propulsion plant.

Construction was completed in Spain this year on a special vessel, the Artabro built for the Capt. Iglesias expedition to explore the upper reaches of the Amazon river. This ship is fitted with a diesel electric propulsion plant. The generators and motor were built in Spain to American designs, and the control board was built at East Pittsburgh. This plant consists of two engine generator sets, each comprising a 205 kw., 250 volt, 575 rpm., main generator and a 50 kw., 220 volt exciter and a four-cylinder Burmeister & Wain engine; and a 500 hp., 300 rpm., double armature propelling motor, with control board. The usual variable voltage system of control is provided with stations in the engine room and pilot house. This type of drive gives the pilot complete maneuvering control from the bridge and enables him to operate at very low speeds. These characteristics will be very valuable for navigating on an uncharted stream having many obstacles.

Work is now in progress on the construction of a diesel electric propelling plant for a new survey vessel, the Robert Gray, for the U.S. Engineer Corps, for use on the Columbia River. There will be two Enterprise engines, each driving a 225 kw., 210/250 volt, 450 rpm., main generator and a 20 kw., 125 volt exciter. The Westinghouse main generators will supply power to a 550 hp., 250/300 rpm., double armature propelling motor.

The control will be of the variable voltage pilot house type with more than the usual number of speed points, to provide for accurate maneuvering necessary for the special service in which this boat will be engaged. A novel feature of this installation will be the incorporation of special design features in the main generators and motor to provide for automatically maintaining constant shaft horsepower over a certain speed range on the propeller by special machine characteristics. This vessel is being built by the Lake Washington Shipyards, Houghton, Wash., and will be based at Portland, Oregon.

Despite the low activity in commercial shipbuilding, considerable electrical equipment, chiefly of the direct current type, has been supplied for all classes of ship's auxiliaries mainly for use on small or special class vessels. A new, simplified winch control has been developed.

One of the most important direct current auxiliary installations will be on the two new 11,000 ton tankers being built at the Sun S.B. & D.D. Co., for the Gulf Refining Company. Each vessel will have two 125 kw., and one 25 kw., turbine generator sets which will furnish power to seventeen motors with a total hp. of over 200, excluding cargo pumps, which are steam driven.

A very considerable quantity of electrical apparatus has been supplied for new naval vessels consisting mainly of alternating current auxiliary motors and control, turbine and diesel driven auxiliary generators with voltage regulators and dead front switchboards.

The year 1936 holds promise for important and necessary renewed action in merchant marine building, and the release of considerable work is held pending the enactment of legislation definitely setting the government's merchant marine policy. It is hoped that this will be done early in the next session of Congress. When it is realized that only 2.9 per cent of our sea going freighter and 13 per cent of our tanker tonnage is under 15 years old, it becomes obvious that vigorous measures must be taken soon if we are to maintain or improve our position in world shipping. Time-tried, sea-going electrical apparatus is ready and waiting to play its significant part in the efficient operation of the modern ships our American Merchant Marine so urgently needs.

An American Merchant Marine Policy

(Continued from Page 7)

lysis of the replies, were pursuant to the suggestion of the Hon. Daniel C. Roper, Secretary of Commerce that, prior to the American Merchant Marine Conference, The Propeller Club of the United States (which sponsored the Conference) could render valuable aid by attempting to secure from the shipping industry some solidified expressions of opinion on our merchant marine problem. On receipt of the responses, both the select committee and the committee appointed to prepare the report for the Merchant Marine Conference, felt that inasmuch as all of the committee members were identified with the American shipping industry in some capacity, a further analysis of the replies by an impartial agency would be both helpful and desirable. Accordingly, T. W. Van Metre, Professor of Transportation, Columbia University, was engaged for this purpose. An abstract of Professor Van Metre's findings is reproduced herewith.

I

Merchant Marine Policy

The United States, a great commercial nation possessing a water-borne foreign and domestic trade greater in volume and in value than that of any other country in the world, should have a merchant marine not only adequate to the needs of that commerce and its normal expansion in times of peace, but which will preserve that commerce in time of war; and a merchant marine which can be employed for national defense as an auxiliary of the Navy. The ships of this merchant marine should be built in American shipyards and they should be manned by American crews.

This merchant marine should ultimately be sufficiently large to carry at least one-half the water-borne foreign trade of the country. On some routes, especially those to nearby countries which have little or no merchant shipping, the proportion carried in American vessels should be greater than one-half, while in other routes it seems reasonable that the proportion may be less.

At the present time the proportion of American foreign trade carried in American ships is considerably less than one-half. In all of the country's important trade routes there are reasonable prospects for a healthy growth of American shipping, and on several routes there is a genuine desire and need for ships which are larger, faster and better equipped than those at present in use. The steady revival of foreign trade now in progress should make possible the expansion of the American shipping industry. The operation of ships superior in type and speed to those now employed will serve to stimulate trade.

If the United States is to have a merchant marine adequate to the needs of its commerce and suitable for use as a means of national defense, government aid is indispensable. The cost of construction of ships in foreign shipyards is much less than the cost in American yards, and the cost of operating ships under foreign flags is less than the cost of operating under the American flag. It is impossible for American ships to compete wholly upon a commercial basis with foreign vessels.

Whatever plan of aid is employed, it should be, as nearly as possible, of a **permanent character.** A policy, based upon careful study of all facts and upon past experience should be adopted, and once adopted, it should be **firmly adhered to.** It is only under such a policy, wisely and carefully administered, that needed ships can be built, and replacements and additions made as they become necessary. In other words, if **permanence of the merchant marine** is to be secured, there must be **permanence of national policy.**

The first question to be decided is whether governmental aid shall take the form of complete government ownership and operation of shipping or of private ownership and operation with a government subsidy. Between those alternatives there should be no question as to the proper choice. Not only is government ownership and operation contrary to American tradition and practice, but the lesson of experience is that its results have been highly unsatisfactory. **The American Merchant Marine should be privately owned and operated.**

II

Forms of Government Aid

At the present time the operators of various American ship lines receive government aid in the form of mail subventions. The opinion is general that it would be well to replace this by a system of direct subsidies, subsidies for both the construction and the operation of ships engaged in foreign trade. Should Congress so decide, it should be clearly understood that the lines now possessing mail contracts should be adequately protected in the rights acquired under their contracts. The contracts were entered into in good faith and they should be scrupulously adhered to until their expiration in all those cases in which it is impossible to make an adjustment satisfactory to the contract lines.

The construction subsidy should equal the difference between the cost of foreign and American construction. Contracts for construction should be let as the result of competitive bidding with supervision of the bidding by proper governmental authority.

The present construction loan fund should be continued. This loan fund should be available to the builders of ships for the coastwise trade as well as for ships engaged in foreign trade.

It should be the policy of the shipping industry to keep the merchant marine up-to-date. Obsolete vessels should be scrapped and suitable vessels built to replace them.

The operating subsidy granted to American ships in foreign trade should be such as to bring about equality between the American operator and his foreign competitor. The chief difference between their costs are the plainly visible items in the cost of ship operation. There may also be differences arising from foreign operator subsidies or preferences. None of these differences of cost are permanently the same. The frequency with which changes may occur indicates some degree of flexibility with respect to the payment of the operating subsidy, adjustments being made wherever warranted by changed conditions.

The operating subsidy should be a matter of contract between the operator and the government. The time of this contract should be as nearly possible the life expectancy of the ship for the operation of which the subsidy is to be paid.

III

Administration and Regulation

The work for administering the law should be given to a new and independent commission, or "Maritime Authority" such as provided for in the bill now under consideration by Congress. This authority should devote its undivided time to giving effect to the nation's merchant marine policy.

Some of the members of the authority should be men who have had actual experience in some branch of the shipping industry. Appointments should be made without regard to political affiliation. The merchant marine problem is not a matter of politics, and under no circumstance should it be permitted to become so.

The members of the Authority should be honest and impartial, and above all, possessed with a thorough and a sympathetic understanding of the purpose of the law they are to administer. The ultimate success of any merchant marine policy which may be adopted will depend chiefly upon its administration.

The preponderance of opinion among shipping interests is in favor of giving the duties connected with shipping regulation to a Maritime Authority. The majority are distinctly opposed to the regulation of shipping by the Interstate Commerce Commission. Should such regulation be entrusted to the Maritime Authority, some provision should be made for the co-ordination of the work of the separate regulatory bodies to the end that harmonious policies would prevail for all forms of transportation.

Promotion of the development of a merchant marine will be the Maritime Authority's real opportunity for noteworthy achievement. With regard to this function its authority should be broad in scope, and it should not be hampered by a too precise definition of its powers.

The Authority must have an intimate relationship with shipping companies that are beneficiaries of loans and subsidies. It should therefore have power of supervision in the accounting practices of those companies even to the extent of requiring a reasonable degree of uniformity. The unsound practice of establishing a limit upon profits or of recapturing any portion of profits should by no means be adopted, though profits above a stipulated amount should be applied to the retirement of government loans.

IV

The Problem of Competition

The practice of keeping competition within reasonable bounds by participating in conferences should be permitted to continue, and if possible it should be further developed by joint action of government and steamship operators.

The effectiveness of conferences depends upon their stability and their permanence. Since the usefulness and value of conferences have been admitted, the steamship operators should be permitted to employ the best means known to secure their continuing stability. To this end the practice of granting deferred rebates to shippers should be legalized.

V

Conclusion

During the last fifteen years the shipping legislation which Congress has enacted has been distinctly helpful. The Jones Act of 1920 and the Jones-White Act of 1928 indicate a desire on the part of the government to bring about the creation and the maintenance of a merchant marine adequate to the needs of American commerce. Experience under these laws has been valuable in indicating what should be the nature of a permanent merchant marine policy. It is a hopeful and encouraging sign that Congress evinces a willingness to enact the legislation necessary to give effect to a policy which, under wise and prudent administration, will lead to the development of a merchant marine such as the United States should possess.

The current revival of foreign commerce indicates a brighter picture for the merchant marine. As commerce grows, the shipping industry becomes more thriving and prosperous. The negotiation of reciprocal trade agreements with foreign countries, without detriment to American industries, is favored by the shipping industry.

The shipping industry of the United States gives employment directly to more than 200,000 persons and indirectly to many thousands more. All of the money which the government may appropriate for subsidies in the shipping industry is used in the employment of American labor, and in the purchase of goods produced by American labor. **With reasonable stimulation and aid the shipping industry will become an important factor in the restoration of economic prosperity.**

U. S. Navy and Merchant Marine at San Diego C.P.I.E.

Visitors to the California Pacific International Exposition during the 167 days of its first season got some idea of the size of the world's fair when they walked into the Federal building and found the U. S. Navy on display there.

However, it was a miniature replica of the Navy, with models of the various types of battle craft that make up Uncle Sam's sea forces.

There were clipper ships, the Monitor and Merrimac, Old Ironsides and modern streamlined ocean greyhounds, on display in the huge Palace of Travel and Transportation.

It was fitting that shipping and shipbuilding should take an important part in this exposition, for San Diego has long been recognized as an important maritime city, and an enormous annual volume of sea traffic is handled through this port.

International accord and resultant gains in international trade was spurred by the House of Pacific Relations at the exposition, a unique center of bungalows of different nations where diplomatic and trade representatives of many nations intermingled.

These features will be enhanced for the 1936 season of the exposition, which re-opens on January 15 in response to a marked public demand. The second season will continue for 238 days to September 9, 1936.

Marine Insurance Review

The Underwriter's View of a Marine Safety Program

By J. J. Santry

Manager, Personal Injury Department, United States P. & I. Agency, Inc., New York City

The safety movement with its service to humanity is growing in success and needless to say, progress has been made in the Marine industry. The loss records, however, still show there is considerable work to be done before this industry can boast of a record comparable with the reported progress made in some of the other industries.

The record shows there is a real need for concerted action in the Marine industry as a whole to support the general safety movement. Any serious catastrophe suffered by one shipowner brings forth a lack of public confidence which is reflected throughout the industry. Public condemnation of accidents causing injuries and loss of life instigates the enactment of new laws, or amendments, increasing shipowners' liability. Many of you will recall that other industries affected with a similar public interest have had this experience, and ultimately their realization of the value of the national safety movement caused such a decided change in the situation that their safety records now are used for advertising material. Merely a glance at the records made in accident prevention by these other industries should be sufficient to gain the support of the shipowners.

● Accidents are Preventable

In the Marine industry practically the same problems have been confronted which were encountered in other industries, the major one being to convince shipowners, operators, ship masters and officers that accidents really can be prevented. Our own problem was not with the person who definitely turned down our offer of assistance when first approached on the subject, but on the contrary, with the person who promised to cooperate and never fulfilled the promise. Under such circumstances underwriters must come to the decision that adequate rates cannot be obtained by promises. The other fellow is the one whom underwriters know might eventually be won over because he had the courage of his convictions to say "No" in the beginning, indicating that he was merely unaware of the value of safety work.

● Definite Policy Needed

Satisfactory results in a safety campaign cannot be accomplished if cooperation of the executive leaders, on whom rests responsibility for the creation of a proper attitude toward the work, is lacking. The safety program must be given its initial impetus by an official pronouncement. The executives must enter into the movement whole-heartedly and keep in constant contact with its progress. They should make certain that their policies are being developed systematically and conscientiously, and if this interest is taken there is no reason why, like all other major shipping policies, the safety movement will not be successful.

Moreover, the policies adopted to reduce accidents must be so clearly defined to all in the organization that safe practice will become a part of the daily routine. The accident prevention program must be administered by an experienced safety engineer with a practical marine training in order to procure the full respect and confidence of the seafaring personnel. The sea-going fraternity, particularly the "old salts," are very set in their ways and in many instances would resent suggestions from a person inexperienced in the ways of the sea. Safety education must be intelligently administered, otherwise the entire safety program may become ineffective.

The next important step is the establishment of an organization to initiate, supervise and carry out safety policies and practices. The establishment of ship safety committees has been found to be effective in promoting safe working conditions. The committee members assist in locating hazards, and investigate and report on all accidents. They are the best agency for procuring employee cooperation. The master of each vessel should be held responsible by the management for the successful conduct of the safety committee.

● Statistical Information

No accident prevention program can be well organized without workable, adequate and readily accessible statistical information. This is derived from accident reports. Every injury, regardless of its apparent consequences, must be reported on a regular form setting forth in all detail the facts relating to the accident. Remedial measures may be applied only when the character of the injuries and their causes are known and analyzed. Statistics enable the steamship management to discover past errors and to obtain the information essential to prevent future accidents.

Many shipping companies have organized a medical division in their

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operating department to examine each seafarer applicant as well as keep tabs on the physical condition of old employees. Special attention should also be given to prevent seamen from being employed who are affected with loathsome or contagious diseases. Efficient medical examinations will tend to prevent claims on the part of unscrupulous seamen, who may misrepresent their physical fitness when employed.

In no other business is discipline more needed than in the operation of seagoing vessels. Discipline should start with the inception of employment and all rules should be strictly enforced, including the rules to enforce safe practices.

In order to assist the master and the officers of a vessel to maintain proper discipline members of the crew should be selected by a competent employment manager. The employment of young men in their teens lured by glamorous tales of the sea should be discouraged. The record shows that some of these, lacking the experience and intelligence to evaluate the responsibilities and dangers of working around movable machinery, are employed in berths which should be filled by experienced men. The employment of these youngsters not only increases the danger of accident to themselves and others, but also affects the morale of the other members of the crew, who realize that the place should have been filled by an experienced fellow-seaman.

When a safety program is vigorously pursued, shipowners will find that underwriters credit their effort in making a rate schedule.

[Paper read before the Marine Section of the National Safety Congress at Louisville, October 15, 1935.]

Safety of Life at Sea

Safety of life at sea may be measured to a large extent by the tonnage of ships lost from year to year. It is gratifying to note from statistics published in Lloyd's Register of Shipping that there is a continual trend toward increased safety of seagoing vessels.

During the years 1905 to 1909 inclusive, as shown by these statistics, the average yearly loss of the gross tonnage of world shipping was 1.26 per cent. During the years 1922 to 1924 inclusive the yearly percentage of world tonnage lost was only 0.76 per cent, and during the years 1930 to 1934 it was as low as 0.53 per cent.

The following table shows the average annual percentage of total tonnage which was lost during various periods since 1905 for the United States, Great Britain, and the entire world. These figures refer to vessels each of 100 gross tons or over.

Period		Percentage of United States Tonnage Lost Annually	Percentage of Great Britain Tonnage Lost Annually	Percentage of World Tonnage Lost Annually
1905-1909	incl.	1.26%	1.07%	1.26%
1910-1913	"	0.76	1.15	1.17
1922-1924	"	0.41	0.64	0.76
1925-1929	"	0.44	0.48	0.72
1930-1934	"	0.26	0.35	0.53

The above table shows there is a pronounced increase in safety as revealed by the declining percentage of total world tonnage lost in recent years. The figures also show that for the United States the percentage of tonnage lost in recent years is lower than for Great Britain or for the world total. During the five-year period 1930-1934 inclusive only about one-quarter of one per cent of the tonnage of the United States was lost.

It is believed that the International Safety of Life at Sea Conventions of 1914 and 1929 have been instrumental in bringing about this decline in the loss of world shipping.

[Bulletin, National Council of American Shipbuilders]

New Acetylene Cylinder Manifold

A new wall type acetylene cylinder manifold, the Oxweld Type M-8, has just been announced by The Linde Air Products Company. It is available in a ten-cylinder unit to which extensions in units of five cylinders or ten cylinders can be made. The new manifold has been accepted by Underwriters' Laboratories for listing under their Reexamination Service.

This manifold consists of two high-pressure header units. These feed into a central regulation system which delivers acetylene to the distribution piping system at pressures up to 15 pounds per square inch.

The header unit assemblies are composed of heavy seamless steel tubing with forged steel union connections having stainless steel seat inserts. Header valves for cylinder connections are of heavy construction and are threaded directly into the steel tubing header. The extreme ends of the header assembly are closed with forged steel caps. Connections from the header valves to the cylinder valves are made with flexible leads. Each is coiled to provide sufficient flexibility, fitted with an approved Prest-O-Lite Flash Arrester and is provided with a ball check

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valve in the header end. This guards against the possibility of acetylene from the header being driven back into an exhausted cylinder.

The two high-pressure header assemblies are connected by forged steel unions to a central system of six valves and two regulators for controlling the operation of the manifold. These regulators have been designed for heavy-duty service, and will handle a wide variation in load with less effect on the delivery pressure than would ordinarily be expected.

The pressure in each header is indicated on Oxweld high pressure acetylene gauges located on the headers near the union connections to the regulator assembly. A low-pressure gauge attached to the outlet of the hydraulic back-pressure valve indicates the delivery pressure to the shop piping system. The acetylene manifold should be installed in accordance with the Regulations of the National Board of Fire Underwriters for the Installation and Operation of Gas Systems for Welding and Cutting. An instruction booklet is provided.

Diesel Emergency Generating Set

To comply with the new regulations on emergency auxiliary lighting equipment on board U. S. ships, Hill Diesel Engine Co. of Lansing, Michigan, is offering a compact set

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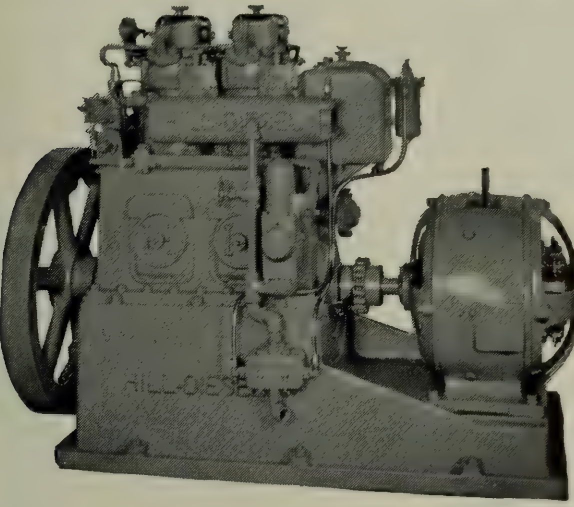

Hill diesel driven marine electric generator for auxiliary or emergency service aboard ship.

comprising a line of 5x7 vertical diesel engines of simple construction, direct-connected to generators, capacities ranging in size from 3 to 60 kilowatts, horsepowers from 10 to 100.

Any good commercial diesel fuel oil ranging from 24 degrees Baume up to and including kerosene may be used, with fuel consumption of less than .48 pounds per brake horsepower hour. Solid injection is made into a pre-combustion chamber—through a large orifice nozzle. Pistons, bearings, and connecting rods can be adjusted or removed through a large handhole plate without taking the whole engine apart.

These Hill diesel sets, backed by 35 years experience meet the requirements of the new law (Supplement 52) pertaining to auxiliary lighting on board ship and pass the U. S. Steamboat Bureau of Inspection requirements.

The entire fleet of the Standard Fruit Company is being equipped with Hill 5-kilowatt diesel generating sets. The Munson SS Company has also recently ordered Hill sets for some of their boats.

Trade Literature

Worm gears for power transmission are now so widely used as to lend general interest to an article by M. M. Wills on their selection, application and maintenance. The principles controlling design, the ratios available, the efficiencies to be expected, the requirements as to lubrication and the standard formulas according to which such gears are now rated, are outlined; also methods of installation. Reprints of the article are being distributed by the De Laval Steam Turbine Co. and may be obtained through Pacific Marine Review.

Bulletin No. 157. A handy reference bulletin on centrifugal pumps for virtually every purpose has just been published by Morris Machine Works, who are the oldest American manufacturer of centrifugal pumps. While the bulletin is primarily intended to illustrate and list the various designs of Morris pumps, hydraulic dredges, and steam engines, it is practically a guide book of centrifugal pumps because of the vast extent of the Morris line which includes single and multi-stage pumps, both horizontal and vertical, for hanling clear water, fine and coarse abrasive mixtures, pulpy materials and chemical liquids on every conceivable service. In addition, the bulletin also includes considerable information which would be useful to centrifugal pump users. Copies of the bulletin may be obtained through Pacific Marine Review.

Ideal Universal Mica Undercutter. This four-page, file-size bulletin describes the improved Ideal Undercutter, manufactured by the Ideal Commutator Dresser Co. This mica undercutter is electrically driven, is equipped with micrometer gauge, and is used for servicing and undercutting commutator mica. The bulletin contains much information of interest to men, whose job it is to keep motors in repair, as this instrument saves hours of hard hand work, can be used in spaces as small as 2¾ inches without removing brush riggings, and cuts to within ¼ inch of risers.

Blister Proof Micarta. A new heat resistant material suitable for application on bar, counter and table tops or any other surface likely to come in contact with lighted cigarettes and cigars has been developed by the Westinghouse Electric & Manufacturing Company. Known as Blister-Proof Micarta, it is made by molding a thin metal sheet directly beneath the surface of the Micarta plate. This sheet acts as a rapid conductor of heat, preventing high temperatures in local spots which otherwise might cause blistering.

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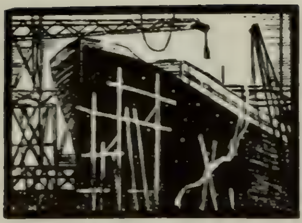

American Shipbuilding

Edited by M. J. Suitor

NEW UNITED STATES LINER PENDING

During December, shipbuilders of the United States were cheered by several important contracts. On December 16, the United States Lines, observing the deadline date set for them by the U.S. Shipping Board granted contract to the Newport News Shipbuilding and Drydock Company for the construction of a duplicate of the liner Washington at a cost of over $11,000,000. S.S. Washington is 668.4 feet between perpendiculars, 86.3 feet beam, with a net tonnage of 13,869, a gross tonnage of 24,289, and a sea service speed of 21 knots.

It will be remembered that the U.S. Lines had opened bids, November 12, for plans and specifications for a larger and faster vessel, and had received no firm bid on these plans, but several bids on duplicates of S.S. Washington and S.S. Manhattan. Bids were then called for December 5 on a duplicate to the S.S. Washington.

As a result of these bids, the contract was awarded to Newport News. This contract is now being investigated by the Shipping Board Bureau of the United States Department of Commerce in connection with the application for a shipbuilding loan and for an operating subsidy under the provisions of the Merchant Marine Act of 1928.

Industry and labor in practically every state of the Union will contribute to the completion of this contract, which will mean a distribution of at least $7,500,000 directly in wages.

SUN SHIPBUILDING SUBMITS LOW BID

Sun Shipbuilding Company, Chester, Pa., submitted low bid at $133.00 a deadweight ton, on the two new 15,000 ton tankers planned by the Socony-Vacuum Oil Company. Bids were opened December 16. It is understood that the two new vessels are to be almost exact duplicates of the Magnolia and Socony Vacuum, recently completed by the New York Shipbuilding Corporation, as latest units in Socony Vacuum's program to replace its great petroleum fleet with new American-flag tonnage.

According to Arthur O. Woll, director of General Petroleum Corporation, West Coast subsidiary of Socony-Vacuum, the two new ships will be 500 feet long, with a cargo capacity of 126,000 barrels. They will have incorporated in their design, provisions for complete fireproofing in addition to all modern navigational aids and provisions for safety of life at sea. Construction of the two ships will provide 2,400,000 man-hours of sustained employment for 2,000 men.

Four Pacific Coast shipbuilders invited to bid on the tankers included the Los Angeles Shipbuilding and Drydock Corporation, San Pedro; Bethlehem Shipbuilding Corporation, San Francisco; General Engineering and Drydock Company, Oakland; and Moore Drydock Company, Oakland.

SHIPBUILDING SHORTS

American Bridge Company, Pittsburgh, Pa., who recently delivered six of an order for thirty barges; 132′x35′x10′; weight 7500 tons; with cargo house; to the Mississippi Barge Lines, St. Louis, Mo.; have received orders from the Tri-State Transportation Co., Inc. for the construction of six standard steel coal barges to be 175′x26′x11′.

Bath Iron Works, Bath, Me., have set February 22 of this year as the launching date of DD366, torpedo boat destroyer, Drayton, building for the U. S. Navy. Keel for the craft was laid on March 20, 1934.

Marietta Manufacturing Company, Point Pleasant, W. Va., has received contract from the Ashland Refining Company, Ashland, Ky., for the construction of a steel oil barge—size 140′x34′x10′ — of 6000 barrels capacity.

Midland Barge Company, Midland, Pa., has delivered 15 of 24 barges, 175′x26′x11′, to the Marion Shovel Company, Marion, O.; also one pump dredge to the United States Engineer's office, Vicksburg, Miss., size 140′x36′x7′6″; as well as one dredge hull, 120′x28′x5′, to the Carrollton Coal and Sand Company.

Spedden Shipbuilding Co., Baltimore, Md., has completed and delivered to the Atlantic Gulf Pacific Company, New York, one steel all-welded dredge tender, May; 57′x14′; powered by 210 b.h.p. Fairbanks Morse diesels.

The New York Shipbuilding Corporation, Camden, N.J., on December 12, last, launched U.S.S. Porter, DD-356, 1850-ton destroyer for U.S. navy.

Bath Iron Works, Bath, Me., has received contract from the U. S. government Hulls Nos. 161, 162, and 163, three 1850-ton destroyers to be known as DD394, DD395 and DD396, respectively. No keels have been laid and no launching dates set. Estimated delivery in the order given above is set at Dec., 1937, Mar., 1938, and June, 1938.

Midland Barge Company, Midland, Pa., is building for U.S. Engineers, Huntington, W. Va., two 15-ton whirler derrick boats with 85-foot booms.

Dravo Contracting Company, Pittsburgh, Pa., reports 20 hulls under construction, with a total gross tonnage of 10,123. These include one diesel sternwheel towboat for stock; two steel hulls for towboats, 169′x34′6″x7′6″ for stock; one steel coal barge 160′x40′x16′ for Oliver Transportation Company, Philadelphia, Pa.; four covered cargo barges, 132′

(Page 39, please)

Progress of Construction

The following Report Contains all the Data Available Concerning the Shipbuilding Work in Progress at the Leading Shipyards of the United States as of December 1, 1935

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Monterey, S.S. Santa Rosa, S.S. Chipana, U.S.S. Ranger, S.S. F. H. Hillman, S.S. President Lincoln, S.S. Capt. A. F. Lucas, S.S. Brookdale, S.S. Antigua, S.S. Santa Elena, S.S. H. M. Storey, S.S. Frank H. Buck, S.S. Nevadan, S.S. Chiriqui, S.S. Midway, S.S. Maunawili, S.S. Pacific, M.S. Pegasus, S.S. Mericos H. Whittier, S.S. President Wilson, M.S. Silverpalm, S.S. Capac, S.S. Malolo, S.S. Talamanca, S.S. Weser, S.S. Manulani, S.S. Marisposa.**

FELLOWS AND STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Hull No. 637, Fellows-Craft V8,** cruiser for Fellows & Stewart, Inc.; L.B.P. 30'; beam 9'; loaded draft 2'3"; speed loaded 16 miles per hour; 90 i.h.p. Kermath V-8 gasoline engine; keel laid June 1, 1935, launched Aug. 1.

Two patrol boats — 45'x10'x3' for California Fish & Game Commission; 275 h.p. Hall Scott Invader motors; speed 20 m.p.h.; keels laid Oct. 8, estimated delivery Dec. 1.

Four cruisers for stock; L.B.P. 30'; beam 9', loaded draft 2'3"; speed loaded 16 m.p.h.; 90 i.h.p. Kermath V-8 gasoline engines; keels laid Oct. 10.

Hull No. 647, Fellows Craft Universal, L.B.P. 35', beam 11', draft 4'6", sail area, 450 sq. ft., sloop rig; engines twin 30 horsepower, universal flexifour; keel laid November 25, 1935; estimated delivery March, 1936.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Port Costa, S.S. Pennsylvania, GAS. S. Sutter, Fish Boat New Ambassador, Fish Boat Sea Star, S.S. Genl. Frank M. Coxe, M.S. Delta Standard, U.S.C.G. Swift, American Dredging Co. Mud Barge, S.S. Lake Miraflores, Gas. S. Hoover, Fish Boat Albatross.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **Yacht Athene, S.S. Constance Chandler, S.S. Chickasaw City, S.S. Lurline, S.S. Maunawili.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **M.V. New Zealand, S.S. Huguenot, S.S. Argyll, Yacht Happy Days, Yacht Seaward, Yacht Volador, S.S. Peter Helms, S.S. Larry Doheny, Shell Oil Barge No. 2, S.S. Point San Pablo, Yacht Enchantress, Yacht Radio, S.S. Brandywine, S.S. Golden Horn, S.S. Golden Hind.**

THE MOORE DRYDOCK CO.
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Lake Frances, Stern Wheeler Frances, Diana Dollar, Margaret Dollar, Brunswick, District of Columbia, Patterson, Emidio, Texas, Lake Frances, Maltha, W. P. Barge No. 1, Dunsyre, Redwood, U.S.C.G. Cahokia, Stmr. Texan, Missourian, Panaman, Davenport, Silverash, Forbes Hauptman, Scotia, Nevadan, Esther Johnson, Covena, Lightship No. 76, Stmr. Dakotan, Vancouver, Brunswick, Olinda, S.C.T. Dodd, Bengalen, Midway, Santa Monica, Santa Fe Barge No. 8, Diamond Head, Midway, F. H. Buck, Kansan, H. T. Harper, Oregonian, F. H. Hillman, Witell, Columbian, Stanley Dollar, Arizonan.**

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: **Six fishing boats—docked, cleaned, painted, misc. hull and engine repairs. 21 ship repair jobs not requiring docking. 31 commercial jobs.**

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); LBP, 334'; beam, 35' 1/8"; loaded draft, 10'10"; geared turbine engines; express type boilers; keel laid August 15, 1934; estimated launching, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); LBP 334'; beam, 35'⅛"; loaded draft, 10'10"; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; estimated launching, Dec. 31, 1935.

DD 393, Jarvis, keel laid Aug. 23, 1935.

Two 1500-ton destroyers for U. S. Navy; contract received August 21, 1934.

Construction of **Destroyer No. 408** authorized.

Care and Preservation (out of Commission): **Aroostook, Jason, Kearsarge, Patoka, Pawtucket, Prometheus, Pyro.**

DRYDOCK, PAINT, MISCELLANEOUS: **Saratoga, New Mexico, Oklahoma, Arizona, Idaho, Swallow, Mahopac, Tatnuck, Challenge, Wando.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Absaroka, S.S. Charles Christenson, S.S. Edwin Christenson, S.S. Charcas, S.S. Condor, S.S. Jacob Luckenbach, S.S. Florence Luckenbach, S.S. Andrea Luckenbach, S.S. Point Ancha.**

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith,** Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery May 1937.

Sturgeon, Submarine (SS187); Order received September 9, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154'; beam 38'; two i.h.p. Atlas engines; keel laid May 25, 1935; estimated launching October 1, 1935.

Hull No. 114. One purse seine boat; 82' L.B.P.; keel laid September 1, 1935.

A labor strike of over two months duration has delayed activities. Are now operating again but the new construction as named above will be delayed by two months.

DRYDOCK, PAINT, MISCELLANEOUS: Complete general repairing on Fidelity and Empress, fishing boats. Also F. H. Marvin, Puget Sound Freight Lines.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges;** 132' x 35' x 10'; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; 6 delivered; further deliveries before March, 1936.

Six standard steel coal barges, 175' x

26′ x 11′ for Tri-State Transportation Inc.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hull No. 159, **Drayton (DD 366)**, torpedo boat destroyer. U.S. Navy; keel laid, March 20, 1934; launching, no date set; estimated delivery April, 1936.

Hull No. 160, **Lamson (DD 367)**, torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launching, no dates set; estimated delivery, June, 1936.

Hulls Nos. 161, 162, and 163; **DD394, DD395 and DD396**; Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA-39, Quincy,** 10,000 tons. Keel laid Nov. 15, 1933; launched June 19, 1935; estimated delivery January, 1936.

Heavy Cruiser CA44, Vincennes, 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD360, Phelps, keel laid January 2, 1934; launched, July 18, 1935; estimated delivery, December, 1935.

DD361, Clark, keel laid January 2, 1934; estimated launching October 15, 1935; estimated delivery February, 1936.

DD362, Moffett, keel laid, January 2, 1934; estimated delivery April 1936.

DD363, Balch, keel laid, May 16, 1934; estimated delivery, June, 1936.

DD-380, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

CHARLESTON DRYDOCK CO.
Charleston, S.C.

DRYDOCK, PAINT, MISCELLANEOUS: **Dredge Howell, Tug Hinton, Snagboat Wateree, Yacht Prosit, S.S. Eastern Sword, Yacht Gay Jane, Yacht Nokomis, Yacht Silver Moon.**

COLLINGWOOD SHIPYARDS, LTD.
Collingwood, Ont.

PAINT, DRYDOCK, MISCELLANEOUS:

S.S. Sarnian, bulk freighter, Northland Steamship Co., Ltd., Port Arthur, Ontario. Bottom damage and tail-shaft drawn for examination.

S.S. Osler, bulk freighter, Canada Steamship Lines, Limited, Montreal, Quebec Bottom damage. Tail shaft drawn for examination.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One yacht,** L.B.P. 115′, beam 17′-6″, loaded draft 5′-6″; speed loaded 17 miles per hour; keel laid February 15; estimated launching October 15; estimated delivery, April, 1936.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hulls Nos. 1237 and 1238, two steel hulls for towboats 169′ x 34′ 6″ x 7′ 2″ of 1540 gross tons.

Hull No. 1239, 1 steel coal barge, 160 x 40 x 16 for Oliver Transportation Co., Philadelphia, Pa., of 1100 gross tons.

Hulls Nos. 1240-1243, incl., 4 covered cargo barges 132 x 35 x 11 for stock, of 2072 gross tons.

Hulls Nos. 1244-1245—two welded towboat hulls 145′ x 32′ x 6′4″ for Pittsburgh Coal Co., of 600 gross tons.

Hulls Nos. 1246-1255, inclusive; 10 welded coal barges 175′ x 26′ x 10′8″ for stock of 4720 gross tons.

This makes a total of 20 hulls under contract, with a total gross tonnage of 10,123.

ELECTRIC BOAT CO.
Groton, Conn.

NEW CONSTRUCTION: Hull No. 19, **fleet submarine, Shark, (SS174):** L.B.P. 298′; beam,, 25′; standard displacement, 1315 tons; keel laid, October 24, 1933; launched May 21, 1935; delivery, Jan. 1936.

Hull No. 20, **Tarpon (SS175):** L.B.P. 298′; beam, 25′; standard displacement, 1315 tons; keel laid, Dec. 22, 1933; launched September 4, 1935; possible delivery, Feb. 1936.

Hull No. 23, **Perch,** S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; estimated launching, April, 1936.

Hull No. 24, **Pickerel, S.S. 177** keel laid March 25, 1935; estimated launching, May, 1936.

Hull No. 25, **Permit,** S.S. 178, keel laid June 6, 1935; estimated launching, July 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser** and **DD369 Reid** for the U. S. Navy, estimated completion dates — Flusser, Nov., 1935; Reid, February, 1936.

MARIETTA MANUFACTURING CO.
Point Pleasant, West Virginia

NEW CONSTRUCTION: **One Steel Hull Anchor Barge,** Hull Size 60′ x 22′ x 4′ with steel A frame, deckhouse, and machinery. To be built under contract with the U. S. Engineers Office at Vicksburg, Miss., and to be delivered at Vicksburg, Miss., in 90 days, contract price $10,200.00. One pipe line dredge for U.S. Engineer's Office, Louisville, Kentucky.

One steel barge, 140′ x 34′ x 10′, of 6000 barrels capacity, for the Ashland Refining Co., Ashland, Ky.

Ten standard steel coal barges, 175′ x 26′ x 11′ for stock.

MIDLAND BARGE COMPANY
(Subsidiary of Treadwell Construction Company.)
Midland and Erie, Pa.,

NEW CONSTRUCTION: **six barges,** 100′x26′x6′6″, for Treadwell Construction Company.

One pump dredge for United States Engineer's office, Vicksburg, Miss.; 140′x36′x7′6″, delivered.

One barge, 100′x24′x8′ for Parsons & Rader.

24 Barges 175′ x 26′ x 11′ for Marion Steam Shovel Co., Marion, Ohio, 15 delivered.

1 Dredge Hull 120′ x 28′ x 5′0″ for Carrollton Coal and Sand Company, delivered.

2 Oil Barges 195′ x 35′ x 9′6″ for Campbell Transportation Co., Pittsburgh, Pa.

2 15-ton whirler derrick boats—85-foot boom for U. S. Engineers, Huntington, W. Va.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359 aircraft carrier CV5, Yorktown, for U. S. Navy; keel laid May 21, 1934; estimated delivery, October 3, 1936.**

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; estimated delivery February 3, 1937.

H361, light cruiser 47, **Boise keel laid Apr. 1, 1935; estimated delivery, August 22, 1937.**

Contract awarded for H362, **light cruiser, No. 49; no dates set.**

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357); Hull No. 410, McDougal (DD358); Hull No. 411, Winslow (DD359);** of 1850 tons each; keels laid, Dec. 1933.

Two light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43), of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge,** Feb., 1936; **DD358, McDougal,** Apr., 1936; **DD359, Winslow,** June, 1936; **CL42, Savannah,** Aug., 1936; **CL43, Nashville,** Dec., 1936.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 1063, Nantucket Lightship No. 112, building for U.S. Dept. of Commerce—Bureau of Lighthouses; L.B.P. 121′-6″, beam 31′, loaded draft 13′, compound engine, 600 i.h.p., 2 watertube boilers, pressure 165 pounds, keel laid July 17, no further dates set.**

SUN SHIPBUILDING COMPANY
Chester, Pa.

NEW CONSTRUCTION: **Hull No. 151 Meadville,** ferryboat for Erie Railroad Co.; L.B.P. 234′; beam, 45′; loaded draft, 18′3″; speed loaded 12-13 m.p.h.; 1700 i.h.p. Skinner Uniflow engine; 2 watertube boilers; keel laid June 10, 1935; estimated launching, Jan. 10, 1936; estimated delivery, Jan. 26, 1936.

Hull No. 152—steel, twin screw, truck automobile and passenger steamer for Virginia Ferry Corporation. Length 260 ft., beam 59 ft., depth 19 ft. 1 in. 2 4-cylinder Skinner Unaflow engines—each 1400 S.H.P. 2 Foster Wheeler Water Tube boilers, cross drum sectional header type 285 pounds pressure. Estimated date of keel laying Oct. 15; launching March 14; delivery March 31, 1936.

Hulls No. 153-154—steam, single screw, steel oil tankers for Gulf Refining Company. Length between perpendiculars 425 ft., beam moulded 64 ft., depth moulded to upper deck 34 ft., loaded draft 27 ft. 6 in. Each vessel: 1 2800 S.H.P. Westinghouse cross compound double reduction geared turbine unit; 2 Foster Wheeler type A 3 drum boilers—400 pounds pressure. Estimated dates for No. 153. Keel laying Nov. 15; launching Apr. 27, 1936; delivery May 20, 1936. Estimated dates for No. 154: Keel laying November 30; launching June 15, 1936; delivery July 6, 1936.

UNITED DRYDOCKS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION:

DD365, Destroyer Cummings, L.B.P. 334′; beam 35′; mean draft 10′10″; keel laid June 26, 1934; launched Dec. 11, 1935; delivery indefinite.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; estimated delivery, June 9, 1936.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; estimated delivery, August 9, 1936.

UNITED STATES NAVY YARD
Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case, L.B.P. 334′; beam 35′;** keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, July 1936.

Destroyer DD371, Conyngham, L.B.P. 334′; beam 35′; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, Oct. 1936.

DD389 and DD390, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD
Charleston, S.C.

NEW CONSTRUCTION: **U.S.S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; estimated launching Feb. 25, 1936; estimated completion date, June 1, 1936.

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; estimated launching Aug. 1936; estimated completion, Jan. 1937.

UNITED STATES NAVY YARD
New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B.P. 600′; beam 61′8″; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, April, 1936; estimated delivery, Dec., 1936.

CL 48, **Honolulu,** light cruiser; L.B.P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January 1937; estimated delivery October 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers.

PG. 50, Erie, gunboat; L.B.P., 308′; beam, 41″; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; estimated launching, January 29, 1936; estimated delivery, May 1, 1936.

CG 69 and CG 70, **Alexander Hamilton and John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308′; beam 41′; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia,** L.B.P. 600′0″; **beam 61′,7¾″; molded depth at side to main deck amidships 42′0¾″; draft corresponding to normal displacement 21′,8½″; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.**

DD372, **Cassin,** L.B.P., 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships 19′,7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid, October 1, 1934; estimated completion date, March 15, 1936.

DD373, **Shaw,** L.B.P. 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships, 19′7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid October 1, 1934; estimated completion, June 15, 1936.

Coast Guard Cutter No. 65, George W. Campbell; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, July, 1936.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61′ 9¾″, depth molded at side to main deck amidships 42′0 3/8″, draft corresponding to normal displacement 21′10″; standard displacement 10,000; estimated completion January 1, 1938.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS 172, Porpoise; keel laid, October 27, 1933;** launched June 20, 1935; estimated delivery, Feb. 1936; **SS 173, Pike, keel** laid, Dec. 20, 1933; launched Sept. 12, 1935; estimated delivery, May, 1936. **SS 179 Plunger,** keel laid July 17, 1935, estimated delivery Feb., 1937; **SS 180 Pollack,** estimated delivery, May, 1937; L.B.P. 289′0″; beam 24′ 11-1/16″; loaded draft 13-9″; diesel electric engines.

Two 1400-ton submarines, SS185 Snapper and SS186 Sturgeon, order received from Navy Department; September, 1935.

UNITED STATES NAVY YARD
Portsmouth, Va.

NEW CONSTRUCTION: Torpedo Boat Destroyer **Tucker (DD374)** for U.S. Navy, 341 ft. long; beam 35′; loaded draft, 10′10″; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, February, 1936.

Torpedo Boat Destroyer **Downes (DD375)** for U.S. Navy, 344 ft. long; beam 35′; loaded draft, 10′10″; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, May, 1936. Laying down lines under way in mold loft.

AMERICAN SHIPBUILDING

(Continued from Page 36)

x35′x11′ for stock; two welded towboat hulls, 145′x32′x6′4″ for the Pittsburgh Coal Company; and ten welded coal barges, 175′x26′x10′8″ for stock.

Federal Shipbuilding & Drydock Company, Kearny, N.J., launched the torpedoboat destroyer, U.S.S. Ried, January 11, 1936.

Trade Announcements and Trade Literature

HOW ENGLAND GOT ITS MERCHANT MARINE, 1066-1776, by Henry C. Hunter. 370 pages bound in blue buckram with gold stampings. Published by the National Council of American Shipbuilders, $3.50 net.

This very scholarly and thorough analysis of the reasons for the growth of the British merchant marine from the time of the Norman conquest in 1066 to the loss of the American colonies that formed the United States in 1776, makes a very interesting and readable volume. The author, Henry C. Hunter, a noted New York proctor in admiralty, as counsel for the National Council of American Shipbuilders, has for many years made a study of shipping legislation in the United States and European countries.

The seven centuries covered by this survey include all of the formative period during which England finally achieved mastery of the sea in both the naval and the mercantile branches of shipbuilding and ship operation.

Included in the book are sections covering the earliest history of British sea trade, and a general review of the growth of English shipping policy, together with a tabulation showing the origin of each navigation principle and how it was affected by subsequent legislation. In addition, there are tables showing the expansion of Britain's commerce and of its merchant marine, including American colonial trade. The Appendices also contain a remarkable document by Sir Walter Raleigh, advocating a new navigation system in 1603; an English treatise of 1747, demanding the complete commercial subservience of the American colonies; and a frank recital by a British historian, written in 1790, of "Why England Lost Her Colonies." There is also a helpful bibliography.

Copies of this volume can be obtained by sending $3.50 to the office of Pacific Marine Review, care of the editor.

New Composite Stainless Steel Bar Stock. Jessop Steel Company, Washington, Pa., has recently developed a new composite stainless steel bar stock known as Silverbond (patents for which are pending), for use in any application where the surface of the bar must have corrosion and temperature resistant properties.

The product is described as being a web-like structure in which low carbon inexpensive inserts to the extent of approximately 40 per cent are mechanically held, as well as welded by pressure applied at high temperatures, so that there is no possibility whatsoever of separation of the component parts. The cladding can be varied from 10 per cent to 25 per cent, dependent upon the application.

Stock is made in rounds, flats, octagons, hexagons, sheets, strips and other shapes to meet special requirements. It is now being used in the manufacture of refrigerator trays and accessories; shaftings where machining is not required, and architectural and general decorative trim.

The insert of the less costly metal reduces the cost of the bar, and will, in some cases, be an advantage in forming and fabricating due to its added ductility.

Insulation in Marine Service. A fifty-page manual of marine insulation, embodying the most complete treatment of this subject ever published, has just been issued by Johns-Manville.

The book presents a thorough discussion of the purposes and methods of insulation for every type of heated and refrigerating equipment to be found aboard ship. It includes full insulation specifications for steam and hot and cold water lines; boilers, furnace walls, breechings and main turbines; auxiliary equipment such as pumps, hot water and hot air heaters, air-conditioning equipment and turbines; refrigerated rooms, equipment and piping; and the insulation and fireproofing of bulkheads, decks and ceilings.

In addition to the specifications the manual includes several technical discussions on the subject of marine insulation. An outstanding feature in this regard is a section devoted to exterior temperatures of pipe insulation as related to livable boiler and engine room conditions. The printed information is supplemented by many photographs of product and actual installation as well as drawings showing methods of application.

An appendix gives a complete description of every type of insulation used in marine work and is designed to be a handy reference for the engineer on the subject of insulating materials.

A copy of this manual, "J-M Insulation in Marine Service," may be obtained through Pacific Marine Review.

A DISPLAY THAT WILL BE REMEMBERED

At the Second Annual Marine Exhibition, held November 12-20 at the Maritime Exchange Building, New York City, the Columbian Rope Company presented an unusual display which will long be remembered by those who saw it.

It was Columbian through and through from the characteristic red, white and blue Columbian colors to the familiar life-like figures of old Cap'n Mark, who has played such a prominent part in Columbian advertising for several years. Even the manner in which Columbian Rope is made was revealed to visitors through the medium of a motion picture which was shown continuously during the exhibit.

There were coils of small 3/16-inch diameter rope to the mighty 14-inch circumference hawser. There was also the glistening, silky appearing Yacht Rope, Transmission Rope, Anchor Cable, Tow-Ro, the famous patented Columbian Towing Line, Tarred Rope, Copperized Rope and various Fishermen's specialties.

In addition to rope, the booth contained an assortment of Columbian twines, from the handsomely colored broom twine to the large, stout bundling twines. Every conceivable form of put-up gave a concise picture of just how Columbian packages its twines, which are made from flax, hemp, jute, paper, manila and sisal.

Many people who stopped at the Columbian Booth had the pleasure of meeting Captain Bob Bartlett, internationally known explorer and skipper of the famous schooner "Morrissey". Captain Bartlett, who uses Columbian exclusively, was in attendance the greater part of the exhibit.

Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

● La Purisima Reconditioned

Moore Drydock Company and Union Oil Company officials are shown in the accompanying illustration upon the occasion of the inspection of the La Purisima reconditioning job recently completed at the Moore yard.

You will find several familiar countenances in our photograph. Reading from left to right are:

George B. McLean, Port Engineer, Union Oil Company; Wm. Groundwater, Director of Transportation, Union Oil Company; J. Moore, President, Moore Drydock Corporation; William Harrower, Superintendent, Moore Drydock Corporation; N. Levy, Secretary and Treasurer, Moore Drydock Corp.; A. L. Quackenboss, Marine Representative, Union Oil Co., San Francisco; L. Lishman, First Mate, S.S. La Purisima; Jos. A. Moore, Jr., Sales Dept., Moore Drydock Corporation; Captain E. Belin, Master, S.S. La Purisima.

The Union Oil Company tanker has now been returned to service after an extensive tank reconditioning job.

The La Purisima has been in continuous service as a combination carrier for upwards of fourteen years, and it became necessary to recondition her forward refined oil tanks in order to maintain her in this service. Accordingly bids were thrown open for the reconditioning job, and the contract was awarded to the Moore Drydock Company.

The vessel entered the dry dock on October 14, and the work was carried out under the supervision of George B. McLean, Union's port engineer. On December 7, after a final inspection by Wm. Groundwater, director of transportation for Union Oil Company, the ship was released, and is again back in service as a combination carrier. The renewal of the refined oil tanks, according to Mr. Groundwater, fits the La Purisima for at least another ten years of combination service. She is commanded by Captain E. Belin.

● And Speaking of this Union Oil Tanker

During the American Petroleum Institute convention, recently held in Los Angeles, A. O. Pegg, superintending engineer of Union Oil Company's marine department, was selected to represent western petroleum shippers in the development of regulations governing the transportation of inflammable materials.

The appointment was made by the Pacific American Tankship Association, at the request of J. B. Weaver of the Bureau of Navigation and Steamboat Inspection Service, a Department of Commerce organization.

Authorization to formulate regulations was granted the Department of Commerce by an enactment of the last Congress, and Mr. Weaver called on the petroleum shipping interests to aid in the consummation of the project.

The committee will draft a manual complete in one volume, covering all phases of tanker operation, and divided sectionally into chapters dealing with such matters as life saving equipment, fire fighting and prevention, construction and maintenance of vessels, crew regulations, loading and discharging, etc.

The body is comprised of petroleum marine men representing shipping interests in all parts of the country, and according to Wm. Groundwater, director of transportation for the Union Oil Company, will be occupied for about six weeks with this assignment. Mr. Pegg will remain in Washington until the committee's work is finished.

Propeller Club Climaxes 1935 Season with Banquet

● Propeller Club of California Climaxes 1935 Season with Banquet

A kaleidoscopic scene met the eyes of Propeller banqueters on their arrival at the Fairmont terrace-plunge, Friday evening, December 13.

Upsetting the age-old tradition which treats on the superstition of sailor-men, the Jinx date had no terrors for a record attendance. Yes, sir—every ticket was sold up to full capacity.

For the nautically-minded the plunge locale made an ideal setting. Colorful—glamorous, with lights of the entire spectrum catching the ripples of the pool.

A Speaker's Table (from which no speeches emanated) faced the 36-foot stage across the water. Banquet tables were placed port and sta'b'd, forward and astern. It was a grand sight!

As for the evening's fun—what more could have been done for our complete entertainment! Thirty acts of fast-moving headline attractions clicked off one after another, without a lull. Aquatic novelties were a great feature—you know, clown divers and swimmers, and champions who made many of us think of the day of the "ole Swimmin' hole".

President Charles H. Robertson was honored by the presentation of a handsome gift—a tribute voiced by Chairman of the Board of Governors, Captain F. M. Edwards.

The President expressed his thanks for the cooperation his fine administration has received and stated that the Club is looking forward to greater achievements out ahead.

This Christmas Banquet and Jinks will long be in the memories of our good fellows.

Propeller Club of California Elects for 1936

On Tuesday, January 7, at the annual meeting of officers and members of the Propeller Club in San Francisco the following were elected:

President: Joseph J. Geary.

Governors: (3 year term) H. H. Brann, Jos. J. Coney, Bernard N. DeRochie, Geo. E. Swett.

Governor: (2 year term) Charles E. Finney.

On November 16, 1933, R. Atwood, of San Francisco, passenger aboard the Matson-Oceanic liner, Monterey, between Sydney, Australia, and Auckland, New Zealand, threw a bottle containing a copy of the radio news issued aboard the liner that day, with his own name and address written on the back of a menu card, into the sea. A few days ago, the enclosures were returned to Mr. Atwood from Brisbane, Australia, with the following message:

> "Found on a beach north of Calcundra, 80 miles north of Brisbane, Queensland, on Sunday, November 11, 1935. Sorry I cannot return the bottle. Wishing you a Merry Christmas and a Happy New Year for 1936."
>
> B. G. Litchfield,
> Ashgrove, Brisbane, Queensland.

● Tubbs Extra Superior Now Tape Identified

For the purpose of ready identification, Tubbs' Extra Superior Manila first grade rope and specialties of this grade now carry a tape embedded in one strand showing the trademark, name of manufacturer and statement "Guaranteed to be first grade Manila Rope".

The tape may be readily found by unraveling a small portion of the strand so identified.

Since this appears in first grade Manila rope and specialties only, it is the buyer's assurance that he is receiving the very finest quality backed by eighty years of Tubbs' manufacturing experience.

L. E. Archer, passenger traffic manager of the Panama Pacific Line, acted as host one evening last month at a Mexican night reception and entertainment in celebration of the entry of his company into the field of tourist travel with Mexico. The affair was held aboard the liner Virginia, at Pier 35. Motion pictures representative of Mexican life were shown, and a talk on "Travel Highlights in Mexico," by Marcene Riley, was a highlight on the program. Two Panama Pacific ships—the Pennsylvania from San Francisco on January 4, and the California on January 18, will open the Mexican tourist service with trips to Acapulco on the West Coast by liner, and thence by motor to Mexico City, the return trip being made by rail.

Fred G. Archbold, long time engineer surveyor for Lloyd's Register in San Francisco, has been transferred to Los Angeles, where he is succeeding **William Alderson**, retiring.

● Federal S.B. & D.D. Sends Greetings!

One of the most attractive cards arriving during the holidays was the striking art-reproduction sent out by Federal Shipbuilding and Drydock Company of Kearny, New Jersey.

The large-plated illustration showed a bow-on view of one of the two new tankers now under construction at the Federal yard.

The text-greeting read:

"May your holidays be freighted with joy, and may the launching of the New Year bring you a full cargo of health, happiness and prosperity!"

We liked the art-photo so much that we have used it for this month's front cover of Pacific Marine Review.

Another distinctive card which our staff appreciated and enjoyed was the seasonal greeting of A. L. Becker, consulting marine engineer in San Francisco. Mr. Becker's card carried a plate showing the 433 foot sailing ship "Preussen" with a canvas spread of 59,000 square feet—a truly beautiful reminder of the days of sail.

Holiday greetings from Robert L. Hague showed Skipper "Bob" and his "first mate"—and the whole canine crew from the dogwatch bringing in the Yule Log on the good ship "Sibia".

Final details are being worked out for the inauguration of a new steamship service this month from the Pacific Coast to the United Kingdom, according to **Leslie Comyn,** who formerly operated a fleet of refrigerator ships from Seattle and other coast ports to the United Kingdom and the Continent. The first vessel in the new service will be the Swedish motorship Falsterbo, of the Brostrom Line, which has been chartered by Mr. Comyn.

Captain Harry Jensen, former master of the Grace Line steamer Coya, airplaned from Los Angeles over thousands of miles of Central America to assume command of the steamer Condor, to relieve **Captain Nils Richter,** forced by illness to surrender his post at Puntarenas. **Captain Jake Reznik** has replaced Captain Jensen on the Coya.

The marine trade throughout the nation has grown to expect something rather exceptional each year during "calendar time" from Columbian Rope Company of Auburn, New York.

The 1936 Columbian calendar comes up to full expectations—the worthy contemporary of a proud line of sailing ship paintings by Charles Robert Patterson. This year's subject is the extreme clipper ship—the N. B. Palmer, showing her on one of her usual fast runs as she "speaks" another American ship at sea.

The Palmer was launched February 5, 1851, by Westervelt and Mackay, New York, for the owners A. A. Low & Brothers. She was commanded while under their ownership by another brother, Captain Charles Porter Low who was chiefly responsible for her reputation of speed and beauty.

She was one of the fastest sailing ships ever built and was an excellent sea boat, especially in heavy weather. Her first three voyages were from New York to San Francisco and thereafter, while American owned, all were to Hong Kong or Shanghai.

In China, this ship was known as "the Yacht" and with her nettings in the tops, brass guns, gold stripe, and her lavish entertainment on the Fourth of July and Washington's Birthday, she well deserved the title.

On July 1st, 1852, in the South Atlantic, she had a little brush with the Flying Cloud which proved that they were about equal in sailing ability.

The N. B. Palmer was sold in 1873 and was abandoned in 1892, while under the Norwegian flag.

Henri Morin de Linclays, resident general manager of the French Line in New York City, proved himself somewhat of a Santa Claus to the personnel of his staff this Christmas, by announcing that the company will grant a special bonus of $125.00 each to employees in the American organization who achieve parenthood, the plan being retroactive to include all employees who had offspring born during 1935. The decision to make this gift was not inspired by any desire to increase the birth rate, Mr. de Linclays announced, but merely to give expectant parents the peace of mind which comes from knowing that at least a portion of the expense of the "blessed event" is thus underwritten.

Harry C. Proctor, dean of stewards for the Pacific Steamship Company, and for many years chief steward aboard the H. F. Alexander, died January 1, after a six-month illness.

Up and down the Pacific, from Puget Sound to Valparaiso, passengers on Grace Liners enjoyed a hilarious New Year's eve, according to **Fred L. Doelker.** The Charcas was in port in San Francisco, the Santa Elena in Mexican waters, the Santa Rosa in New York, and the Santa Paula on her way west from that metropolis . . . but in port or out, bunting, confetti, horns and other noise makers were in evidence, and the New Year was ushered in with all the traditional noise and gaiety.

Stephen Lindo, former marine superintendent of the Los Angeles Steamship Company, passed away at his home in Lomita, California, on January 2. Death resulted from heart trouble, from which Mr. Lindo had suffered for some time.

Born in San Francisco in 1884, "Steve" was one of the many "South of the Slot" boys who took to the sea and made good. After an apprenticeship at the old Union Iron Works he went to sea. After becoming chief engineer of the Pacific Mail Manchuria, he returned to the Union Iron Works until after the war. From 1920 until 1933 he was port engineer, and later superintendent for the Lassco Line in Los Angeles. He acted as marine superintendent for the Los Angeles Shipbuilding and Drydock Corporation until the time of his death.

To our old customers: those Shipowners and Masters who have protected their vessels with FEDERAL MARINE PAINTS . . during . .

1935

And to our new friends: who will discover the enduring qualities of FEDERAL Compositions and Paints during

1936

Our best wishes for a Happy and Prosperous New Year!

The Federal Composition & Paint Co.

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PACIFIC MARINE REVIEW

FEBRUARY 1936

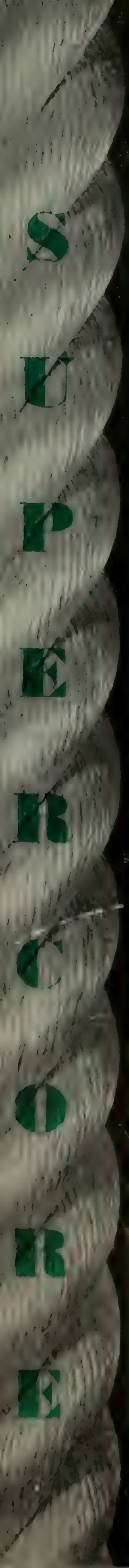
By
P.M.R.
Staff
Photographer
William
Schaeb

Official Organ

PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

SHIPOWNERS ASSOCIATION
OF THE PACIFIC COAST

Tubbs Rope at Sea . . .



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means *Super-Wear!*

There's no exaggeration in the statement that Supercore Manila Rope means a rope that will give SUPER-WEAR. And, aboard ship, this means rope that is safer, more dependable and more economical.

It is the patented construction of Supercore that makes it the outstanding rope of the Marine Field. The inside fibre, instead of being twisted as in ordinary rope, is laid parallel. This greatly reduces internal friction and wear. The entire rope works as A UNIT, each section taking its equal share of the load. This makes Supercore from ten to thirty per cent stronger t ordinary rope, depending on size.

This method of manufacture, ex sive by Tubbs on the Pacific Co also offers other outstanding vantages. For Supercore is m elastic and flexible—wet or To the man on deck this mean rope that is easier to handle—g its work done faster.

When extra strength and safety a factor, be sure that Supercore aboard. You can now easily id tify it by our new tape marker.

Both Tubbs Supercore and Tubbs Extra Superior Manila are now easily identified by our new tape marker.

Tubbs Cordage Company

200 BUSH STREET · SAN FRANCISCO
Mills in San Francisco

Supercore licensed under Whitlock Patents June 23, 1925; October 20, 1925; August 3, 1926.

PACIFIC MARINE REVIEW

FEBRUARY, 1936
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Going down twenty fathoms, life being fed to him through a hose, his only hope of coming back a single length of rope. No wonder that divers demand the finest rope for that job! No wonder that Plymouth Ship Brand Manila Rope is trusted by so many divers and others whose work involves hazards to life and property.

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PACIFIC MARINE REVIEW

VOLUME XXXIII FEBRUARY, 1936 NUMBER 2

Editorial Comment »« »«

Pacific Coast Shipbuilding Prospects

The favorable prospects for the shipbuilding business in America and in the world have not at any time since the close of the war building program been as favorable as they are today. Among many reasons for this optimistic outlook are:

(1) The rapid return of world trade toward normal volume;

(2) The full depreciation and practically complete obsolescence of the large majority of the world's commercial ships;

(3) The ability of naval architects, marine engineers, and shipbuilders to produce marine transportation units of much greater overall economy than the great majority of units in use today;

(4) The determination of the world's great naval powers to maintain their fighting and naval auxiliary fleets at full strength;

(5) The urgent necessity for a very heavy replacement program in the world's tanker fleets and particularly in American tanker fleets.

These reasons working together have already produced during the past year quite a shipbuilding boom in Europe and during the same period a naval shipbuilding boom in the United States. In the past six months tanker orders have come to Atlantic Coast American yards in greater volume than for several years back.

What bearing has all this on the Pacific Coast? A very important bearing is shown by the following considerations.

(1) A number of Pacific Coast steamship owners are under contract with the U. S. Shipping Board to build new tonnage as part of their obligations under the postal contracts now in force. During the depression, for one reason or another, they have postponed this construction program. As business improves and if the Federal shipping policy becomes firmly stable, these companies will be actively in the market for new ships. Other intercoastal and coastwise steamship companies will find replacements imperative. Several such firms are now designing ships. Atlantic Coast yards are fast filling up with naval and commercial work and Pacific Coast yards will have the "edge" on such work.

(2) All Pacific Coast tanker fleets are badly in need of replacements and since they are owned by Pacific Coast firms who would find a large market for their products in the Pacific Coast shipbuilding payrolls, they will favor Pacific Coast yards.

(3) Practically all shipbuilding legislation now before Congress carries a clause which entitles a Pacific Coast shipyard to a differential in bidding for vessels on which Federal loans are being arranged if those vessels are for Pacific Coast owners and service.

New Standard Oil Tanker R. P. Resor, described in January Pacific Marine Review, taken at sea shortly after delivery by the Federal Shipbuilding and Drydock Company. She is the first of many that will soon be filling the shipbuilding ways of Atlantic and Pacific Coasts.

[Photo by Lionel Dottin

Twenty-Five Years Ago

Some excerpts from Number 2, Volume 8, of Pacific Marine Review, published in Seattle, February 1911, *"The First Established and (then) The Only Exclusively Marine Paper Published on the Pacific Coast."*

"Due to the fact that private shipbuilders have declined to *bid* for the construction of two revenue cutters for the Treasury Department, because they are unable to come within the limit of *cost specified by Congress,* Assistant Secretary of the Navy, Beekman Winthrop, has requested five of the principal navy yards to submit *estimates* at which time the work could be undertaken by the government."

Speaking of subsidies, we note this item: "The contract held by the Canadian Pacific Railway Company for carrying Canadian and British mails between Liverpool and Hongkong, expires April 6 next. Arrangements are now underway for larger and faster liners for this service, provided C.P.R. secures a new contract. The present contract has been in force for three years with an annual subsidy of $225,000.00." Steamers then on the Pacific run of the C.P.R. were Empress of China, Empress of India, and Empress of Japan, twin screw liners of 6,000 tons gross, supplemented by Monteagle, 6,163 tons gross.

"The Union Iron Works of San Francisco has secured the contract from the Interisland Steam Navigation Company of Honolulu for the construction of a steel steamer." This was the Kilauea, 240 feet long, 36 feet beam, 19 feet deep, with a cargo capacity of 1,000 tons on 16 feet draft. She had 34 first class staterooms with two berths each. She was powered with a four-cylinder triple expansion engine of 2,400 horsepower, taking steam from four Scotch type marine boilers, and could do 14¾ knots at sea. Cost, $336,000.00.

"The Port of Portland is having plans prepared for another 30-inch suction dredge, and bids are to be received February 24 for a steel hull sternwheel towboat for Portland-Astoria towing service."

The C.P.R. steamer Princess Adelaide had arrived on Puget Sound December 17 in splendid condition after her "15,000-mile voyage from Glasgow, Scotland." She was the talk of the Sound. Latest in interior decorations. Among her revolutionary features were: "A fireplace in the observation room; a unique grill room finished in white and gold with service a la carte at all hours"; four bridal suites "with four-poster brass beds, dressing tables, and adjoining bath rooms"; and 113 staterooms, "many equipped with both hot and cold running water." Perhaps the most remarkable feature of this vessel as described in Pacific Marine Review of that date is the propulsion unit which consisted of "a four cylinder *slick tweedle balance* with cylinders 27, 42, 43½, 43½ inches diameter and 39 inch stroke." How our old friend Yarrow must have chortled over that one.

There had recently been passed in Japan for the encouragement of the Japanese shipbuilding industry, an act imposing a heavy tax on all tonnage acquired abroad by Japanese shipowners after July 1, 1911. "Belated Japanese buyers are now in the market for secondhand boats, and owing to the improvement in freight markets they will have to pay high prices."

We were still fighting against "the threatened invasion of British, Japanese, and other foreign registers in the domestic trade between the mainland and the Hawaiian Islands, a bill having been introduced during the present session of Congress to suspend the Coastwise Law now in force between the mainland and the territory of Hawaii."

The National Merchant Marine Congress "called by the Merchant Marine Committee of One Hundred under the auspices of the National Association of Manufacturers at Washington, D.C., January 23 and 24" had been "in every way a success."

Rivers and Harbors Appropriation Bill carried an appropriation of $220,000 for deepening the channel into Los Angeles inner harbor from 20 feet to 30 feet; an appropriation of $150,000 for deepening Oakland estuary channel from 25 feet to 30 feet; $150,000 for Columbia River and Willamette River channels and $950,000 for work at mouth of Columbia River; $300,000 appropriated and $655,000 more authorized for Gray's Harbor entrance channels; and numerous smaller items for Pacific Coast Harbors.

There was under construction at the foot of Spear Street, San Francisco, Pier 23 for the American-Hawaiian Steamship Company "one of the largest, most modern, and best equipped docks on this coast."

Notwithstanding all this, we had sadly to record: "The third session of the 61st Congress is rapidly drawing to a close and nothing has been accomplished as yet in the way of providing encouragement for the upbuilding of our merchant marine."

Morale Aboard Ship

The following question and answer is taken from papers of a student at the Officers', Cooks' and Stewards' School, San Diego, Calif.:

"What influence has a good mess-boy on a ship?"

"A mess-attendant can influence a happy ship in a great deal. Suppose I'm a Captain's boy, early in the morning I prepare everything ready and set for the Old Man. What he got to do is just slip in his nice well brush uniform, shiny shoes, bright brass buttons, and clean white hat. When he walks and pace the deck he says good morning to the exec. and he is in a happy mode. Then in turn the crew is happy because the two big shots in the ship didn't raise hell because I make the first happy by doing extra work early in the morning."

(Bureau of Navigation Bulletin No. 26.)

Pacific Air Lines and Foreign Trade

America Once More Speeding on the Wings of the Wind to Reap Rich Commercial Profits in Oriental Trade

By Stanley C. Kennedy
President, Inter-Island Airways, Limited

The already shrunken map of the world is being even further contracted as we sit here today. Across the heavens of the western Pacific a giant flying ship is winging its way to the distant Philippines. It is pioneering, opening up, a new international route of communication and transportation. It is the roaring harbinger of American trade expansion in the Orient.

Five days ago that great clipper ship of the air was resting on the waters of San Francisco Bay. The following morning it slipped quietly into the tropical waters of Hawaii. From San Francisco it has sped along its course, carrying the American flag along an **all-American route** across the greatest ocean in the world.

As the four powerful motors lifted the 25½-ton craft into the air the event marked the beginning of a new commercial era for America. America was again in the age of those famous Clipper ships which made our nation the leading commercial maritime power of the world almost a century ago.

Today we have entered a second clipper ship age, an age destined to repeat the glorious expansion of American trade and commerce, of American influence, of American leadership which early wind blown clipper ships of wood and canvas began.

After England, France and the Netherland had penetrated the Orient with their air lines, the Far East was much closer to Europe than it had been. Now, thanks to aviation, the Far East is brought at least four days closer to the United States than it is to Europe. England's planes make it in nine days. Ours make it in five. Steamers from America can reach China faster than those of Europe.

What does this signify?

We have the fastest communication system between our manufacturing centers and the Orient. We have the fastest steamer service between the manufacturing-shipping centers and our Far East markets. In plain words, the United States can deliver the goods faster than our European competitors.

The world, we know, is groping for ways and means of re-establishing international trade relations. Air transport should be vital to a solution.

In this connection, our ability to deliver the goods faster than our competitors finds the recent statement of Daniel Roper, Secretary of Commerce, interesting. Said Mr. Roper:

"We must not forget that in the past quarter of a century we have had prosperity only during those times when our foreign trade was flourishing; that, once foreign markets are lost they can be recovered only by offering quality and rendering services not offered by another country."

Can the United States offer this to our Far Eastern markets? We can. The quality of our goods goes without saying. We can offer quality and we can offer rapid delivery.

The flying Clippers have brought the Orient as close to New York as

A new Sikorsky S-43 amphibian for the Hawaiian Interisland Airways, Ltd. taking off from Alameda Airport on a flight over San Francisco Bay area. This plane was crated and shipped to Honolulu to carry passengers and mail between the islands of the Territory of Hawaii.

the Pacific coast states are by train from the Atlantic seaboard. Hawaii is only overnight from San Francisco, 28 hours from Chicago, 32 hours from New York and Washington. The people of Hawaii are doubly happy today for today's conference is indicative of the future. We have with us today outstanding business executives of the nation, from the Pacific to the Atlantic. They are men whose time means much.

We trust that with the opening of passenger air service their visits and the visits of other businessmen will become more frequent. Such visits are of mutual benefit, giving us an opportunity to know you better and for you to know us. Such visits will result in a closer feeling and stimulation of trade between us.

Many executives have felt they could not afford the time, short though it is, that is required to visit this island section of the United States, especially if they live upon the Atlantic seaboard. Within a short time they will be able to leave their offices and 36 hours later be in Honolulu.

Honolulu because of this and other geographical and climatic factors is to become the great liaison point of Pacific trade. Air routes will center here, as do most of the trans-Pacific steamer services. Honolulu offers a central meeting point for business men of the Orient and Occident. In time it will become as famous as a conference and business city as it is a vacation land at present. The city is growing rapidly in size and commercial importance but with the coming of air transportation it will grow even more rapidly.

If one might today pick out an individual American city and call it the commercial city of destiny, that honor might well be given to Honolulu, truly the crossroads of the Pacific.

Now that Hawaii is only overnight from San Francisco and the Orient is just five days away how can American business profit?

A recent report by Pan-American Airways showed that 78 per cent of their passengers between the United States and South America were salesmen. Note that, please. More than three-quarters of all passengers on the air line were salesmen. Salesmen of American goods. Salesmen opening up new markets for American merchandise. Salesmen who were awake enough to use the fastest means to keep in touch with their customers.

Executives are asking another pertinent and reasonable question:

"Now that Hawaii is as close to the rest of the United States as Cuba, now that mail can reach Shanghai as quickly as it could travel from New York to California by train ten years ago, why not establish that agency in the Pacific we have always wanted?"

Why not, indeed. Even now, when admittedly commerce is not at its normal height, the Far East does a four billion dollar a year trade with outside countries. Under better world conditions that great market has done a business of more than twice four billions. Speaking conservatively, a seven billion dollar a year market exists just five days from San Francisco and only 14 hours more from New York.

There is hardly an article of commerce that will not be affected. Samples, advertising matter, movie film, machine parts, drugs and a thousand and one other types of light-weight high-value products will fly over this All-American air route.

Of great importance is the speeding up of postal service. By steamer routes it now takes between two and three weeks for a letter to reach the Far East. With airmail the letter will be received and the answers and accompanying orders will be back at the home office in almost the same length of time. It will slash in half the time element of getting, filling and delivering orders in the Far East.

I do not feel it necessary to point out the great savings air service will

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One of the new China Clippers outbound from San Francisco to Honolulu and the Orient is here shown over the south tower of the new Golden Gate bridge. San Francisco and Yerba Buena Island in the background.

Photo by Clyde H. Sunderland.

The Coast Survey on the Pacific Coast

Chapter IV. *North West Coast Surveys*

By Captain Thomas J. Maher
U. S. Coast and Geodetic Survey

During the Eighties the efforts of the Survey were directed toward the proper charting of the Oregon and Washington coasts. Fair progress was made in the Straits of Fuca, in Puget Sound and in the waters within Washington territory, but the difficulties along the outer coast so hampered operations that but little was accomplished. It was necessary to chart the shore line before the hydrographic surveys were started. On May 1, 1887, Captain John F. Pratt and Fremont Morse started from Damons Point (now Browns Point), Grays Harbor, to make a topographic survey of the coast from Grays Harbor to Cape Flattery. From Damons Point to Point Grenville the distance was measured with a one hundred meter steel tape and beyond that the measurements were made by telemeter.

Outfit and supplies for the party were moved as follows: From Damons Point to the Quinaielt (Quinault) Indian Agency by wagon; thence to the mouth of the Queets River on the back of klootchmen (Indian squaws); from the Queets to the Hoh River by Indian ponies and klootchmen; from the Hoh to Toleah by canoes. From Toleah to Quillayute on the backs of Indians; thence to the Waatch by canoe, and from Waatch to Neah Bay by wagon. The work started on May 1 and ended on June 13. It was accompanied by many troubles which at that time appeared serious but now seem amusing. Some years ago Captain John F. Pratt told me of these experiences. He said that when they started from Damons Point he expected to get a pack train of twelve or more Indian bucks but found that the men were off fishing or hunting and it looked for a while as if the party were going to be tied up on account of the lack of means for transportation. The wife of the Indian chief told him that the squaws could do all the work that his outfit needed and that if he weren't satisfied, he could do his own packing. When they were ready to start, twelve husky squaws appeared on the scene. With many misgivings the party started out, after making the necessary arrangements regarding pay. In handling boats and in packing, Captain Pratt found the squaws the equals of the men. Progress was rapid and satisfactory for three or four days. Then one morning no squaws appeared. About 10 a. m. he sent over to the chief squaw's tent to find out the cause of the delay. She informed him that the pay was too little and that the Indians were going on strike. An increase in pay was given and work was resumed. On the following day the same thing took place, resulting in a similar readjustment of pay. This was repeated for several days until the salary was double or treble that originally agreed on. Finally the party reached a section of the coast where it was possible to get help from another tribe farther to the north.

Then, one morning about ten a. m., Captain Pratt did not appear for the daily powwow concerning an increase in wages. Time went on and none of the surveyors appeared for work. Apparently the Indians got a little worried; such action was not part of the program at all, so about three p. m. the Indians sent a messenger to Captain Pratt. He informed them that he was going on strike and was not going to work any more, as the Indians wanted too much pay. The chief squaw came to his tent and after a powwow, agreed to a reduction in pay. The following day he went on strike again, the result of which was another reduction. After several days of this procedure, the squaw came to Captain Pratt's tent early one morning, slapped him on the back, chuckled in Indian fashion, and informed him that if he quit going on strike, the Indians would not go on strike and they would work for their original wages. No further trouble was experienced in that section with the natives. The Indians seemed to enjoy the humor of the situation, as Captain Pratt was the only one who ever got the better of this squaw in a bargain.

On September 18, 1887, a whale boat from the Steamer McArthur was capsized while on duty in Shoalwater Bay, resulting in the death of an officer. On August 17, 1894, the Coast Survey Steamer McArthur anchored about one and one-half miles offshore from Jo Creek, which lies about seventeen miles north of Grays Harbor, Washington. That afternoon Lieutenant Crosby, Commanding Officer, with nine men, landed through the surf and started to erect a hydrographic signal. The sea was smooth. On Saturday morning there was a dense fog and a long swell. At seven-twenty a.m. the Commanding Officer with nine men in the whale boat left the ship to complete the erection of the signal. When outside the surf line, he directed the men to take all the precautions which are requisite for safety in going through the surf, such as removal of shoes and heavy clothing, casting off of trailing lines of the oars, and unshipping the rudder and substituting a steering oar. He cautioned them that if upset, they should get hold of life preservers or oars, dive under the breakers and come up when necessary to breathe and make for the beach. They proceeded a short distance, when they were caught by a heavy breaker. The boat apparently broached and was capsized by a second breaker. Five men succeeded in getting ashore, most of them in a dazed and exhausted condition. They immediately notified the white men and Indians along the beach, who took up the search for the others. The fog was very heavy, and visibility was not greater than forty to fifty yards. No other landing could be made from the ship, so about eleven a. m., when the fog began to clear, the officer in charge ran in as close to the shore with the ship as was safe, but nothing could be done from the outside, so he proceeded inside Greys Harbor and anchored near Damons Point. C. P. Eaton, the Ensign in charge, secured a team and with two men drove up the beach to the scene of the disaster. Members of the crew and settlers patrolled the beach. On the way back to the ship, the team ran away while crossing a bridge over swampy land. The occupants were thrown out. The Ensign escaped with a sprained hand and leg and bruised head. One of the men had a bad hole made in front of his left leg, above the ankle, reaching to the bone. The bodies of Lieutenant Crosby and three of the men were washed ashore at various dates, that of Lieutenant Crosby six weeks after the accident.

The charting of the waters of southeastern Alaska was carried on at a rapid rate, but the discovery of gold along the Nome beach caused a demand for charts of western and northern Alaskan waters. It was necessary to get parties to the Behring Sea region and to furnish boats suitable for making surveys in those waters.

A contract was let on April 9, 1898, to the Gas Engine and Power Company and the Charles L. Seabury and Company, Consolidated, for the construction of the Steamer Yukon, 75 feet long, 15.7 feet beam, and 3 feet 9 inches draft. She was shipped by rail, in pieces, to Seattle, Washington, and finally landed at St. Michael, Alaska, on July 3, 1898. This vessel was transported, in pieces, six thousand miles by rail and water, and then rebuilt on the beach in the field of operations. This work was accomplished under the direction of Captain J. F. Pratt. For that time it was a notable achievement, and would be for any time, with the facilities then available.

The surveys which had been made along the Pacific coast of the United States satisfied the needs of slow speed, shallow draft vessels, but were unsatisfactory for the use of high speed, deep draft ships. A strip of water less than ten miles wide, bordering the coast line, was closely sounded. Beyond that soundings were very few. In fact, there were large areas with no soundings at all. This condition was due entirely to the fact that no means had been developed for properly surveying those waters under the conditions which existed along this coast. Fog, haze and smoke reduced visibility to such an extent that there were only a few days each year when soundings could be accurately located beyond ten miles from the coast, and it was not until the development of under-water sound ranging that adequate surveys could be made. By this method the position of a surveying vessel is located through the measurement of the time of transmission under water of sound from the ship to two or more points near the shore. Knowing the times of transmission and the velocity of sound in sea water, the distance of the ship from the shore points can be readily computed. Radio acoustic ranging, as this method is called, grew out of World War developments. The basic problems in the application of the method to hydrography were solved by Dr. Eckhart of the National Bureau of Standards and Captain Heck of the Coast and Geodetic Survey. The latter suggested the use of the recording apparatus aboard ship instead of at shore stations as in all previous applications of the method, a change which has proven essential to success. The apparatus was modified by Almon Vincent, chief radio operator on the Steamer Guide, so that the weight of the equipment at each shore station was reduced from a half ton to a few hundred pounds and the cost from two or three thousand dollars to less than two hundred dollars. He also developed it so that its operation is now automatic.

Another development about this same time was that of the fathometer, whereby depths are determined through the transmission of sound to the bottom of the ocean and back. The utilization of these two methods or devices increase the output of our surveying ships several hundred per cent and enable us to make offshore surveys with the same degree of accuracy as those bordering the coast. Surveying operations as a result thereof can be carried on during the day or night in all conditions of weather, stormy, foggy, or clear, with equal facility.

Only when these two methods came into use, was it possible to start making the coastwise charts which the mariner now uses, those which give all details for a distance extending eighty to one hundred miles offshore. The writer used these methods in making the survey from Grays Harbor to Destruction Island, that section of the coast where the commanding officer of the McArthur was drowned and where Captain Pratt had his experience with the Indians.

The demands of commerce called for more than a chart which just shows the depths. A chart must now show with certainty that no dangers exist. For the purpose of taking advantage of currents and to reduce to a minimum the effects of head winds and seas, coastwise traffic hugs the shore closely, and it is along the path followed by these vessels that those dangers lie which cannot be located by soundings. These are the pinnacle rocks. Wire drag operations extending from one to two miles offshore have been started. A strip from San Francisco to San Simeon has been wire dragged. Unfortunately this work, and in fact all hydrographic surveying work along this coast, has been suspended during the past several months, as no funds were provided for the continuance of the operations. The entire coast line should be wire dragged. A great part of it could be done for far less than the one hundred twenty-five thousand dollars damage sustained a few years ago by a vessel which reported striking a pinnacle rock or other obstruction along this coast. In addition, for making provisions for the continuance of this wire drag work, means should be provided for an extensive series of current observations from the Mexican border to Cape Flattery.

In a future issue I shall give a short description of some of the best known vessels of the Coast Survey which have operated in Pacific and Alaskan waters, and also a brief history of the five or six men to whom is due credit for the progress of the Coast Survey on this coast.

The Future of The American Merchant Marine

An Analysis of the History of American Sea Experience and the Marine Efforts of Her Principal Competitors Indicates Our Wise Course for the Future

By Ernest E. Johnson

Chapter V.—*Shipping Policies of Japan*

Few realize that this interesting country sailed everywhere along the eastern routes of the Pacific and Indian Oceans before the Tokugawa Shogunate destroyed all ships over fifty tons, forbade new buildings, prohibited foreign ships entry for any purpose and completely isolated Japan from the rest of the world. This took place in 1609, due to unfortunate contact with foreign emissaries and their exploitation. Between this period and 1853, only five ships visited Japan, a Russian at Hokkaido 1778, a British at Nagasaki 1808, another British at Uraga 1822, and two American at Uraga, one in 1837 and another 1847.

Practically all tonnage in Japan is owned and/or controlled between the cities of Kobe, Osaka, Yokohama and Tokio. An overnight railway journey takes one to any one of these points. Further, only a half dozen or so owners and operators control all Japanese merchant tonnage. There are numerous owners who are interested in ships purely from a financial side. Operators, like Yamashita, charter these ships on a sort of bare boat basis which is peculiar to Japan. This charter is called "Hadaka", under which the operator furnishes the officers and crew, pays for upkeep of ship, insurance, etc. Yamashita Kisen Kaisha, the largest Hadaka operator, usually has from 700,000 to 800,000 gross tons, and Daido Kisen Kaisha ordinarily operates from 300,000 to 400,000 gross tons under this form of charter. Between them they operate from 75 per cent to 80 per cent of the tonnage owned by some 200 capitalists. This, therefore, permits a very unified control, approximated only by Germany, France, and Italy, and, like these, is subject to a very paternal and strict government supervision. Let us see how it operates:

● Wise Government Control

As a supplement to the 1930 loan Act the government organized the Shensutsu Kaigan Kyokai, meaning Ship Standard Improvement Association. This was formed by leading Japanese shipowners and shipbuilders functioning under the auspices of the Ministry of Communications. Their studies included:

Adjustment of demand and supply of vessels to be scrapped or built.

Establishment of a subsidy scheme for each year.

Formulation of a program for scrapping and building.

Certification of contracts between owners and builders.

To act as agents for owners in the procedure to obtain subsidy.

To watch for and maintain observance of the various terms and conditions called for by the state scheme.

To supervise collective bargaining in the negotiations with steel manufacturers and/or shipbuilders.

To prevent importation of foreign vessels.

Adjustment of value of vessels to be broken up.

To afford facilities to shipowners for raising of building funds.

Another organization, Kaiji Kenkyukai, meaning Shipping Research Society, held meetings with Japanese Steamship companies; resolutions were drawn and presented to the Japanese government for:

Unification of marine administration.
Control of subsidized lines with an age limit for subsidized ships.
Establishment of a marine bank.
A government-fostered program to ship and travel on Japanese vessels.
Reform of import tariff on foreign-built and -owned vessels.

After an exhaustive study it was found that ocean-going vessels over 1000 gross tons were:

Age	Number	Gross tons
Under 12 years	263	1,204,980
Under 17 years	331	1,153,006
Under 27 years	126	555,138
Over 27 years	212	649,222

From this it was determined that more than one million tons were obsolete and should be scrapped.

● Scrap and Build Plan

Consequently, September 1932, the Japanese government approved a supplementary budget of eleven million yen for a three-year program to build 200,000 gross tons and scrap from 400,000 to 600,000 tons of obsolete Japanese vessels of at least 1000 gross tons each and over twenty-five years old.

On October 1, 1932, the ship construction law became effective. It was motivated by:

Too many obsolete ships.
Need of faster, more economical ships to enter competitive world trades.
The naval value of a fleet of fast new merchant vessels and tankers.
Industrial and national strategic value of maintaining efficiency of private shipyards and furnishing employment to skilled labor.
The law provided a construction bounty of:
Yen 45,00 per gross ton for a speed of less than 14 knots.

Yen 46,00 for a speed of 14 knots.
Yen 0.50 for each additional ½ knot up to
Yen 54,00 for a speed of 18 knots and over.

The new ships were to be cargo ships of not less than 4000 gross tons and not less than 13½ knots speed.

Ships to be constructed under the supervision of the Ministry of Communciations and the Navy.

The shipping company to receive the subsidy must scrap two tons of obsolete tonnage for each new ton built.

Subsidy to be paid: half upon keel being laid; the other half when vessel is commissioned for sea, provided by then the obsolete tonnage was placed in the hands of scrappers.

All new construction to be in national yards with Japanese labor and materials, including fittings and engines.

All vessels built under the terms of the subsidy not to be disposed of or rebuilt without approval of the Ministry of Communications.

At first the program had slow going. The drop in the exchange value of the yen by more than 60 per cent had no effect at home; a yen purchased full value in Japan. The fact is, the purchase value of the yen in Japan actually rose 2 per cent and, naturally, freight and passenger earnings, paid in foreign money, purchased that many more yen; so owners found they could operate old obsolete tonnage at a profit. That partly explains the tremendous purchase of old tonnage in world markets for scrapping in Japan. By the end of November 1932 the facilities for easy money for construction purposes had become operative, owners fell in with the government plan and the program was in full swing. By March 1933 the 100,000 tons allotted for 1933 had been authorized and an additional 81,200 tons has been applied for.

Today more than 50 new economical motorships of from 5500 to 9800 gross tons each, with a speed of from 16 to 18¾ knots, are actually operating in Pacific waters. These are cargo ships, not passenger or combination carriers. Every owner knows full well that such speed is not required for the carrying of the type of cargo imported into Japan. These ships are for quick delivery of manufactured goods which are in competition with all other manufacturing nations of the globe. Their value as naval auxiliaries to the Japanese navy is fully understood.

Naturally, the success of the first three-year program brought on a demand for further modernizing of the Japanese merchant marine fleet. This has been decided upon. The new program is to cover a five-year period. Five hundred thousand gross tons of obsolete shipping is to be scrapped. The new ships to be built are to be large and speedy and include both cargo ships and combination freight-and-passenger liners, additional high class liners for the San Francisco route being stressed.

Chapter V.—*A Short History of American Maritime Policy*

A short review of our maritime history leading up to 1916 and the cause for the tremendous war expansion is probably necessary.

I have stated that our ships have been legislated both into and out of existence.

The early British Navigation Acts were prohibitory in nature. Our early shipping laws were permissible but with restrictions. These laws were forced upon us to protect our trade and our shipping, which was completely essential to a people located on a seacoast replete with splendid natural harbors and navigable rivers, and restricted by natural impediments to easy travel by nature's highway, the sea and the rivers, free and open to all.

1789—The first act of Congress was to pass discriminatory duties on goods imported on foreign ships, practically forcing importation by American ships.

1792—Congress passed the Ship Registry Act, limiting American-built, -owned and -operated ships to the American flag and the benefits derived thereunder.

Under these beneficial laws the proportion of American foreign commerce carried in American ships rose from 23.6 per cent in 1789 to 92 per cent in 1807.

1815—Peace treaty between England and America concluded, whereby America abrogated all discriminatory duties against and opened all our ports to British ships. This caused ruin to American ships.

1817—Congress passed the most important and consistently enforced Act ever promulgated. Coastwise trade was restricted to American-built, -owned and -operated ships. By this Act American coastwise shipping grew from 68,607 gross tons in 1789 to 6,852,536 gross tons in 1914.

The Act also prohibited importation of goods except by American ships or ships of the country of origin of the goods (direct trade).

There were further retaliatory and discriminatory Acts in 1818, 1820, 1823 and 1827.

1828—Congress dumped overboard the preferential policy of Washington and his colleagues and enacted our Reciprocity Law. From that Act can be traced the gradual but effective throttling of the American ships on the high seas. British ships trading with American ports gained nearly 600 per cent between 1830-1841.

1841 — Senator Thomas Butler King, southern democrat, in advocating mail subsidies not less liberal than British subsidies in the trans-Atlantic trade, stated: "British statesmen are resolved to monopolize the intercourse between America and Europe."

1845 — The southern democrat, President Polk, in his message to Congress, stated his views, which are as true today as then: "The national policy by which a rapid communication with the distant ports of the world is established by means of American-built steamers, would find ample reward in the increase of our commerce, and in making our country and its resources favorably known abroad."

By reason of this agitation and general public demand, a Mail Act was passed by Congress.

1847—Under this Act four steamship companies were formed:

(1) Ocean Steam Navigation Company, with service to Germany; (2) Collins Line, with service to England; (3) United States Mail Line to Panama; (4) Pacific Mail Line on the Pacific. These contracts were for ten years.

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Tar on His Thumbs

"During the morning of the 31st of August, 1851, the loungers on San Francisco's waterfront noticed on Telegraph Hill the signal for a ship coming in. Then they saw the messenger hurrying down the hill, evidently in great excitement. The more energetic hurried over to the Plaza to hear the almost breathless announcement, 'Flying Cloud in from New York in 89 days on her first voyage.' What a thrill that must have been, and what a ship!" So spake the stocky sailorman with the sandy hair and the piercing blue eyes.

"Now she is rounding Steamboat Point and soon will drop anchor in the stream. All hats are off to this beautiful stranger as she makes her first bow to the great swarming camp that was then San Francisco. Poetic souls could almost hear a blast of triumph from the trumpet at the mouth of her white angel figurehead.

"Captain Josiah Perkins Cressy, one of the most competent navigators that ever cleared from Boston, and a great driver of sailing ships, paced her poop. Suddenly at an order the yards are backed, and, as she loses way, the crew swarms aloft to make all snug; the anchor drops to a hold off Meig's Wharf, and a boat is over the side to bring the captain ashore.

"Eighty-nine days and twenty-one hours from up anchor off the Battery to down anchor inside the Golden Gate. Boy, can you imagine anything like that? Take a look at her as she sits there now in the bay—235 feet long from knightheads to taffrail; 40 feet, 8 inches beam; 21 feet, 6 inches depth of hull—with perhaps 2000 tons of cargo and 100 passengers. In the bay swell kicked up by the northwest trades she rises and dips as lightly and gracefully as any of the gulls that surround her. Her main yard spreads 82 feet and her main top towers 180 feet above her deck. Her concave bow lines are so sharp that her width on the 'tween deck level 18 feet aft of that apron is only 11 feet.

"Of course, she had to have favorable winds, but the 'breaks' were not all favorable in this voyage. Three days out from New York she lost her main and mizzen top gallant masts. She made the line in the Atlantic, 21 days out from New York, made 50 degrees south Atlantic in 47 days, was seven days from thence to 50 degrees south Pacific. Have you ever been round the Horn, boy? Very few Americans of this generation have. To the sailing ships that was the test. Often it took several weeks—weeks of sailing over watery mountains, weeks of little if any headway against wind and wave, weeks that tried the souls and bodies of officers, crew, and passengers as perhaps no other regular routine duty has ever done in the world's commercial history.

"We will never see such ships again, but those of us who love their memory delight to collect remembrances of those days of wooden ships and iron men. More than anything else we take pleasure in finding correct models of these old beauties of oak and canvas.

"Here is a model of Flying Cloud, with every line of her hull reproduced to a gnat's eyelash—every rope in its place—every sail furled on its yard, just as they were when she lay ready for delivery at the dock in Donald McKay's yard, East Boston, Mass.

"In the case along with this beautiful clipper we have placed for comparison a scale model of the Nina, one of the Spanish caravels used by Columbus on his first trans-Atlantic voyage."

The husky sailorman paused for breath. The spick and span model stood in its gleaming case on the polished mahogany desk in the office on the 23rd floor of the RCA Building.

The Flying Cloud was not alone. Around her were ranged models of other ships that have made maritime history, copied line for line and to scale, the world's finest collection of ship models.

Around the walls were paintings and photographs of ships. Some of the paintings were worth a king's ransom. In lockers and safes were marine curiosia, skrimshaw, objects of ivory, rare maritime documents. Few museums can boast such a display.

The collection is the property of Robert L. Hague, general manager of the Marine Department of the Standard Oil Company of New Jersey, for he was the stocky sailorman with the blue eyes. Its history is bound up with the adventurous saga of its owner, the success story of a lad who went to sea more than thirty years ago as an apprentice boy on a windjammer and rose to the command of a fleet whose flags are seen wherever men go down to the sea.

Mr. Hague was born in Manville, Rhode Island. His father was an Episcopal minister, but young Hague had a bent for the sea. When he was a youngster he cruised to the Grand Banks with kinfolk on the fishing fleet.

When he was seventeen years old it was decided that it was time for

Scale model of the Mayflower, on which the Pilgrim Fathers crossed the Atlantic.

Famous American clipper ship Flying Cloud, contrasted with the Nina, tiny caravel of Columbus.

him to go to sea in earnest, so he was shipped as an apprentice aboard the Susquehanna, a full-rigged ship, bound from Philadelphia to Yokohama, Japan.

From Yokohama the Susquehanna returned via Hawaii, where she was loaded with sugar. The round trip took all of fourteen months, and when young Hague got back his thumbs were full of tar, and he walked with the roll and pitch of a full-fledged sailor.

For a number of years he stuck with the sailing ships, then shipped over into steam, joining the fleet of the Standard Oil of California.

Meanwhile he had found time to go railroading, and he prides himself on the fact that he is a locomotive engineer.

He rose to be chief engineer, fleet official. He knew not only his own job but everything that was to be known about ships, their construction, maintenance, and operation. In 1920 he came east and joined the Standard Oil Co. (N. J.) organization. His promotion to president of the Standard Shipping Company followed.

Then he began to gather his collection. Hague had always loved ships and the sea more than anything else in the world. When he was a foremast hand he used to visit galleries in the ports where his ships called and admire paintings of tall vessels and stormy seas.

"I always wanted to buy them," he said, "but I never had any money."

As his salary mounted, he began to

Cuts by Courtesy of Rockefeller Center Weekly.

Photos by Wendell MacRae.

U.S. frigate Constitution. Probably the only correct model of Old Ironsides in existence.

The whaler Rosa Baker, of Nantucket. She made many voyages to the South Seas in search of sperm and right whales.

accumulate models, paintings, and photographs. His offices at 26 Broadway became famous.

When the Standard Shipping moved to the RCA Building, he spent days arranging the decorations of his suite. He and Robert F. Hand, assistant general manager of the Marine Department, Standard Oil (N. J.) occupied the offices running completely across the building overlooking the Plaza.

Mr. Hand is also a lover of marine art, and the two so arranged it that the walls of their offices were completely covered with marine masterpieces.

One of Hague's most prized ship models is that of the U. S. frigate Constitution, "Old Ironsides." His model, he says, is probably the only correct one in existence. Even the official model in the Navy Department at Washington, Hague believes, is that of another ship.

The Mayflower, on which the Pilgrim Fathers crossed for their landing at Plymouth Rock, is also represented by an accurate scale model.

A curious bit of naval architecture is the model of a Chinese junk.

"The Chinese are a smart race," said Hague. "They knew a lot about building ships. For example, they were putting balanced rudders on their junks as far back as the beginning of the Christian era. We Westeners only discovered the balanced rudder fifty years ago.

"The celestials also knew a thousands years ago that sails with holes in them would handle better and pull harder than sails without holes. Our yacht designers have just discovered that.

"The Chinese also built the first tank ships. Their river junks that carried cargoes of fresh water were built with cylindrical hulls, just like modern tankers, for stability with liquid cargoes."

Most prized of all the interesting articles of his collection is the log book of the Ranger, Paul Jones' first ship, with entries in Jones' scholarly script from the time he took command in 1778 until he turned her over in 1779 after sinking the British frigate Drake and concluding his famous cruise.

[Rewritten by permission from an article by John H. Craige in Rockerfeller Center Weekly for January 2nd, 1935.]

On opposite page a beautiful model of bark-rigged sailing ship Saga.

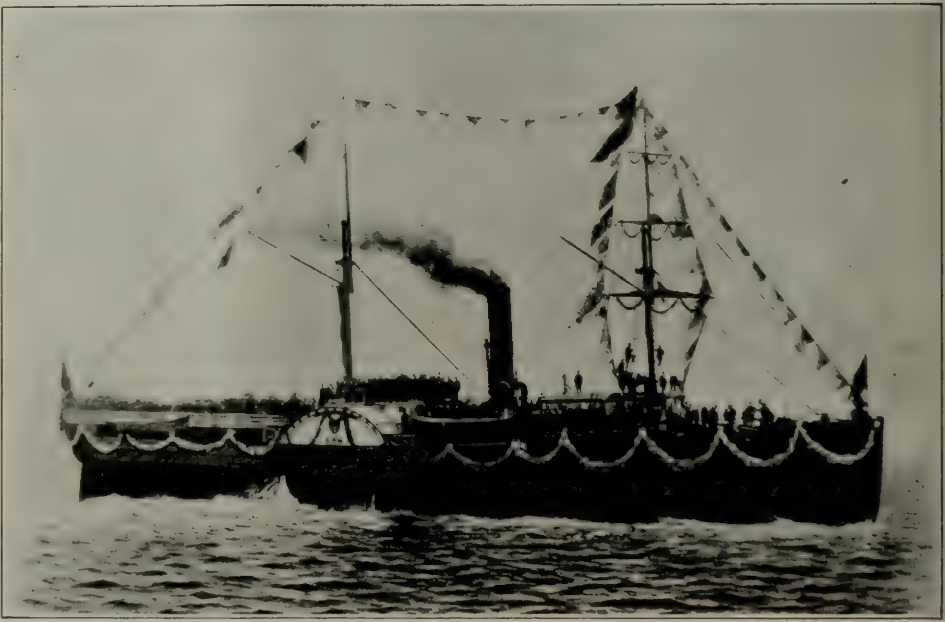
Chinese junk with cylindrical hull for carrying water. These were the first tank vessels in existence. She also has a balanced rudder and perforated sails.

. . . . Old Time
Pacific Coast Steamships

No. 1 S.S. California—By R. J. Alexander

With the Aid and Assistance of Many Old Timers

From a number of sources we have recently been receiving requests for information on coastwise and trans-Pacific steamers of an earlier date and so have gradually been made conscious that many of our readers are interested in marine Californiana other than that pertaining to the sailing ship. This consideration led to the collection of pictures and data with the thought in mind of publishing each month a short history of some nineteenth century Pacific coast steamer. To start such a series, especially starting it in the month of February, what steamer could be more fitting than that grandfather of them all, the California, first American steamer to enter the Pacific Ocean and first American steamer to pass through the Golden Gate into the bay of St. Francis? Her entry is recorded on the 28th day of February, 1849, so that she is authenticated as that pioneer of pioneers, the true '49er.



California celebrating her 25th anniversary, Feb. 28th, 1874, as photographed off Meigg's wharf by Bradley and Rulofson. Courtesy of F. E. Edwards.

On November 19, 1847, William H. Aspinwall of New York procured a contract from the United States to transport the mail from Panama to Astoria, Oregon. By this contract, for a period of ten years, the government agreed to pay $199,000.00 a year, and Aspinwall agreed to promptly build three steamers and to operate them on a schedule of at least one round trip every two months between Panama and Astoria, and to carry free of charge on each steamer all the mail offered and a government agent in charge thereof. Aspinwall, on April 12, 1849, under the laws of the State of New York, incorporated the Pacific Mail Steamship Company with a capital of $500,000.00 divided into 100 shares "for the purpose of building, equipping, furnishing, purchasing, chartering and owning, vessels to be propelled solely or partially by the power or aid of steam or other expansive fluid or motive power, to be run and propelled in navigating the Pacific Ocean."

In the period between the signing of the mail contract and the completion of the steamers, the Mexican war had been ended and Alta California had come into the Union, and ports in California were added to the proposed schedule.

This project was an amazing thing. At that time steamers burned tremendous quantities of coal to generate small amounts of power; there were three thousand miles of sea, much of it rather dangerous sea in certain seasons, between Panama and Astoria; there was not a single port equipped to properly handle steamers; and there was not a single coal bunker, nor any known supply of bunker coal, in all that region. Yet here was a master manager of sailing ships proposing to build three steamers, steam them out over a 10,000 mile course, and run them on a 3000-mile course which was practically unknown, and all of which was uncharted.

The three steamers were ordered —the California from the yards of that famous New York clipper ship builder, W. H. Webb. She was 200 feet in length, 33 feet, 6 inches molded beam, and 20 feet molded depth, driven by paddle wheels actuated by a side lever type condensing engine, with one cylinder of 70 inches diameter and 96 inches stroke. Steam for this plant was generated by two boilers of the flue type using salt-feed water. These boilers had a total fire surface of 3636 square feet. The pressure those days was usually about 12 pounds, the vacuum about 24 inches. It was always a question whether the boiler or the air pump was the most important auxiliary. California's power plant was built by the famous Novelty Iron Works of New York.

Paddle wheels for the California were of 26 foot diameter, 8 feet 9 inches wide, and had 24 buckets. Her hull was built of white oak, live oak, and cedar, with the underwater body sheathed in copper. The underwater lines were very fine, and much resembled those of some of the best clipper ships. She had staterooms for 60 cabin class passengers, arranged aft and mostly opening into the dining saloon. Open berths forward would accommodate up to 180 steerage class passengers. She had bunker space for 500 tons of coal, carried three masts, and was rigged as a brigantine.

Launched on May 19, 1848, California left New York for Panama on Oct. 6, 1848. Down New York bay she made 12 miles per hour. Her best 24-hour run between New York and Callao averaged 11.87 miles an hour. For 42 steaming days on this run, she averaged 8.68 miles an hour. This vessel at sea had no provision for ballasting to preserve draft and trim as coal was consumed. Consequently, as she rode higher in the water her side wheels became less effective.

California was under the command of Captain Cleveland Forbes. On the first day out he was informed that the cross-head was cracked. He ordered the spare cross-head dug out from under the coal in the hold, and then after many complaints from the few passengers aboard because the ship was becoming dirty, and out of trim, he decided to go on watchfully and use the old cross-head, keeping the spare ready for emergencies.

An old photo by Bradley and Rulofson showing the California at dock and old sailing ships in background. Courtesy of W. Muir.

On October 21, the first fire drill was held. All went off smoothly "hose pipes and water were soon in requisition and all pumps quickly in activity to extinguish the fire". We quote from the journal of Dr. Stout, ship's surgeon. "At the equator, October 24, the captain endeavored to make me see the line by fixing a small stick across the spy glass." On November 1, the captain discovered that he had overrun the latitude of Rio and put back, reaching that port on November 2, twenty-six days out of New York—then the record time for any passage between the two ports and the longest trip made up to that time at sea under a continuous head of steam.

The California at the old Pacific Mail Dock, San Francisco, on a misty day about 1870. From the M. Behrman collection.

California lay 23 days at Rio, making repairs and taking on coal. Weighing anchor on November 28, she made the Cape of the Virgins early on the morning of December 7, and by noon of that day was in the Magellan Straits. After some adventures with "Willewahs", rocks, narrow channels, and the desire of officers, passengers and crew to go ashore and "stretch their legs", the California, on December 12, 1848, finally rounded Cape Pillar and became the first American steamship to breast the long Pacific swells. They certainly were in no hurry. A year later, the clipper Flying Cloud ran from 50 degrees S. Atlantic to 50 degrees S. Pacific in seven days, logging a distance that must have been at least three times that covered by California in transiting Magellan Straits. On December 16, they arrived at Valparaiso. Here there was much demand for passage to California but the ship took on only coal and an assistant commander named Marshall, Captain Forbes being sick. Callao was entered on December 27, and here they got first authentic news of the great gold strike in California and frantic demand for passage to San Francisco.

On January 10, California cleared from Callao with 17 cabin class passengers and about 80 in the steerage. On the afternoon of January 17, 1849, California dropped anchor in the bay of Panama. Ashore were over 500 persons with their baggage and stores who had been days or weeks awaiting her arrival to take them on to the "Promised Land of Golden Dreams". Some held through tickets to San Francisco, many had no tickets of any description. The steamer that was expected to take them north had accommodations for about 240 and had already over 90 passengers aboard from Peru.

After much bickering, California finally got away from Panama on February 1, with 365 passengers, 36 crew, and all the coal she could carry. She arrived at Acapulco, February 9, after much trouble over food, service, and sleeping accommodation, and some very bad weather in the Gulf of Tehauntepec.

At Acapulco, she replenished water and provisions and got away on the 11th. Stopping at San Blas for a few hours, and at Mazatlan for a day, she rounded Cape San Lucas on the 17th, and passed San Diego on the night of February 20. Coal was getting short. She burned 15 tons a day and had taken none aboard since leaving Panama. She got up through Santa Barbara channel, and apparently the coal was done, wind was light, water and provisions were getting very scarce. An attempt was made to unship the buckets of the paddle wheels, but this proved impracticable. Then all hands got busy and cut out all the superfluous wood and split and piled it for furnace fuel. While doing this, they discovered approximately 100 sacks of good bunker coal that had been stored between frames when the ship was outfitting in New York. Up came the coal, and she steamed into Monterey on February 23. There she got a great welcome, and there she lay till some 30 cords of wool had been cut and placed aboard. This, together with some additional coal found secreted about the vessel was judged enough for her short run to San Francisco, and in the early evening of February 27, California put to sea. About 10 a.m., February 28, she headed in through the Golden Gate, 145 days out from New York. Of this elapsed time, 67 days had been passed in port and 78 days at sea.

Thus was inaugurated a great day in the history of early San Francisco —Steamer Day, around which centered the commercial life of the new metropolis. The arrival of this first steamer was a concrete symbol of the fact that there was soon to be regular monthly mail, via Panama, taking about 40 days to reach New York.

California's crew, with the exception of one or two, deserted immediately for the gold fields, and she lay in San Francisco Bay being furnished and outfitted and awaiting the arrival of the coal ship which arrived in April. On April 21 she carried a party of guests around the bay and up to Benecia where the Pacific Mail was establishing a repair yard. On May 1, she cleared for Panama, with 54 passengers and $346,653.25 in gold. Rates were fixed at $250.00 per cabin passenger and $100.00 steerage, San Francisco to Panama. For some unexplained reason, she failed to touch at San Blas for coal, and ran out of fuel before she reached Panama, making it necessary to burn about $4000.00 worth of her upper works to make that port. Followed regular service, along with her sisters, Oregon and Panama. She was employed in Pacific Mail service for 25 years, and as our picture shows, took out an excursion on February 27, 1874, to celebrate the 25th anniversary of her first arrival. Shortly afterwards she was sold to A. Bichard of San Francisco, who in 1875 had her engines and boilers removed, and her hull rebuilt and completely outfitted as a sailing vessel with barque rig.

Occasionally, California ran north to the Columbia River for special service, or to help the regular steamers on that run. In November of 1855, in charge of Captain William Dall, with Chief Engineer Hagan, she was sent to Fort Vancouver on the Columbia River with troops and munitions, there to pick up more troops and take them all to Puget Sound for some Indian troubles there.

Troubles multiplied on this trip. On the Columbia River bar one boiler broke down, steam pressure practically vanished and the vessel narrowly escaped the breakers. During this trouble fire broke out and threatened the powder stores but was extinguished after a hard battle.

At Vancouver she picked up another company of soldiers and steamed north to Stielacoom near the southern end of Puget Sound. After discharging troops and stores, she steamed off for San Francisco and made one of the longest steamer passages on record between Puget Sound and her home port—27 days. Off Flattery, she met a terrific storm which washed the second mate overboard and completely disabled the engines. From Cape Flattery to San Francisco she made it on sail alone. No San Francisco daily, however, got out extras on the missing steamer. In the absence of wireless, it was tacitly assumed by everyone concerned that she was lying at Steilacoom waiting government orders.

Among the captains who commanded California, other than those already named we find Captains Whiting, Whitney, Thorn, Hewitt, Gregory, Rogers, Hayes and Hornsby.

After her conversion from sidewheel steamer to sailing barque, California operated in the coastwise lumber trade for twenty years under various owners, but always with a Bichard as agent. She left Port Hadlock, Washington, with a load of lumber on October 2, 1894, for Salavery, Peru. She had no passengers and had a deckload of lumber of 7,000 feet. On Monday, January 15, 1895 at 8 p.m. in a heavy fog she ran ashore in quicksands, three and one-half miles northwest of Point Arcana, Peru. High seas were running, no help available, and she soon became a total loss although all the officers and crew were saved. Estimated value was $8000.00 hull and $8000.00 cargo, with $3500.00 insurance on the vessel and $8000.00 on the cargo.

Captain J. H. Lukschewitz was master of the ship at the time of the wreck, and her registered owner was James Rodgers, Tiburon, California, with J. Bichard as agent. On February 5, 1895, the wreck and cargo were sold at auction to the highest bidder and brought 5050 soles, Peruvian currency.

In the compilation of these facts concerning the first American steamer on the Pacific Ocean, we have had much assistance for which we here express thanks. Particularly are we indebted to William Muir and F. E. Edwards of San Francisco, to John Haskell Kemble of Berkeley, and to Lewis and Dryden's Marine History of the Pacific Northwest.

The Diesel and New American Shipping Legislation

Report of Marine Committee of the Diesel Engine Manufacturers Association

On January 9 the Marine Committee of the Diesel Engine Manufacturers Association, consisting of Messrs. E. B. Pollister of Busch-Sulzer Bros. Diesel Engine Company; Robert Haig of Sun Shipbuilding & Dry Dock Company; John Thomas of McIntosh and Seymour Corporation; G. A. Rentschler of Hooven, Owens, Rentschler Corporation; and R. E. Friend of the Nordberg Manufacturing Company, had a conference with Secretary Roper at Washington, at which the Committee made recommendations based upon the appended report. The Secretary had no statements to make at that time but he listened most carefully to the recommendations of the Committee and received the report for further study.

New shipping legislation should correct the outstanding lack of the American Merchant Marine — its failure to keep pace with the rest of the world in the adoption of diesel propulsion. If the government is to pay subsidies to offset the higher cost of operating American ships, it should insist that new ships be as economical as foreign diesel ships; and that less economical steam vessels be converted to diesel propulsion before operating subsidies are granted.

The greater sailing radius of the diesel ship enhances its value as a naval auxiliary. This justification for a subsidy should be supported by proper provisions that diesel ships be built, or existing steamers converted to diesel, when, in the opinion of the Navy Department, they would serve, in war, more advantageously than steamers, if the ship is to be built or operated with government aid.

One of the members of any maritime authority set up by new legislation should be qualified by diesel experience and charged with the duty of passing on the comparative value of diesel or steam propulsion for any ship for which application is made for construction loan or operating subsidy.

The Merchant Marine Act of 1920 attempted to protect government interest, financial and otherwise, in ships built with government aid, by provisions that such ships "shall be fitted and equipped with the most modern, the most efficient, and the most economical engines, machinery and commercial appliances." But the almost total lack of diesel ships in the past fifteen years of American shipbuilding demonstrates the necessity for more rigorous phraseology of new shipping laws. Otherwise the building of lower cost, less efficient, steamships to benefit by subsidy may be expected to continue.

Since 1920, under provisions of the Merchant Marine Act of 1920 and the Jones-White Act, 57 ships have been built through government loans of $134,664,073.40. Forty-five are steam vessels and 12 are diesel, of which latter 9 are tankers, and 2 are Great Lakes vessels. Forty-two ships have been reconditioned under construction loans of $13,279,569.01. All are steamers. Of 89 passenger and cargo ships built and reconditioned with government loans, only one ocean-going ship is diesel propelled.

M.S. Georgia, one of Britain's many fine diesel driven passenger and cargo vessels.

● Modern Diesel the Most Economical Ship

The economy of the diesel over the steamship of any type is an established fact. The diesel ship requires less than .40 pounds of fuel per shaft horsepower at sea compared with over .65 pounds for the most efficient steamers. With full utilization of diesel waste heat in exhaust and cooling water for heating, lighting and other ship's purposes, the thermal efficiency of the diesel ship is above 50 per cent compared with less than 25 per cent for the best marine steam plant, at sea.

In port, the diesel auxiliary fuel consumption is less than 50 per cent of that of the steam auxiliary in operation. A further substantial reduction in cost is made by the diesel in the fact that all cost of operation is promptly cut off when the diesel stops and is ready just as promptly to resume at a moment's notice, without the tedious and costly operation of maintaining steam although not in use. The average steam auxiliary

MERCHANT SHIPS OF FROM 6,000 TO 20,000 GROSS TONS LAUNCHED SINCE 1925

YEAR	United States		Great Britain		Japan		Germany		Italy		Sweden		Other Counties	
	Steam	Diesel	Steam	Diesel	Steam	Diesel	Steam	Diesel	Steam	Diesel	Steam	Diesel	Steam	Diesel
1926	6	1	19	13	0	1	5	7	3	9	0	1	5	10
1927	8	2	21	29	0	0	8	12	1	1	0	5	6	15
1928		2	27	34	2	5	8	14	1	1	0	10	6	28
1929	4	2	19	33	1	9	10	9	1	1	0	7	2	22
1930	12	6	11	82	0	11	11	10	1	3	0	11	3	20
1931	8	4	9	22	1	4	1	8	0	3	0	13	2	30
1932	11	0	0	0	2	2	0	6	0	2	0	3	0	5
1933	0	0	0	3	1	8	0	3	0	1	0	5	0	8
1934	0	0	1	19	2	12	1	3	0	2	0	4	1	11
Total	49	17	107	235	9	52	44	72	7	23	0	59	25	149
Ratio	3 to 1		1 to 2		1 to 6		1 to 1½		1 to 3		0 to 59		1 to 6	

Grand Total—241 Steamers, 607 Motorships—rest of world ratio 1 to 3.

UNDER CONSTRUCTION SEPT. 30, 1935

	2	0	8	18	0	4	3	7	0	3	0	6	4	16

Total—17 Steamers; 54 Motorships—rest of world ratio 1 to 3½.

is of itself notoriously inefficient mechanically even in its best forms; but combined with the boiler operating at a low power the inefficiency and waste are greatly increased and the losses from the cost of maintaining steam over dead periods, when the steam auxiliary may be temporarily shut down, marks the wide difference between the low consumption cost of the diesel auxiliary and the steam auxiliary.

● Motorships Predominate Abroad

Lloyd's reports of world launchings of merchant vessels of 100 gross tons and over show from 1921 to 1934, inclusive, 2,128 diesel ships of 9,782,284 tons; from 1930 to 1934—1,435 diesel ships of 3,673,801 tons, compared with 1,245 steam vessels of 2,924,049 tons; and for this last five-year period, of ships of from 6,000 to 20,000 gross tons the United States built 31 steamers and 10 diesel ships, while the rest of the world built 47 steamers and 314 diesel ships.

World Launchings of Steamers and Motorships in Sizes 6,000 to 20,000

Gross Tons

Year	United States Steam	United States Diesel	Rest of World Steam	Rest of World Diesel
1930	12	6	26	137
1931	8	4	13	80
1932	11	0	2	18
1933	0	0	1	28
1934	0	0	5	51
Totals	31	10	47	314
Ratio	3 to 1		1 to 6½	

Lloyd's latest quarterly report, October 16, 1935, states "At present there are being built 234,000 tons more of motorships than of all other types of merchant ships taken collectively."

● Superior War Value of Diesel Ship

Yet the superior war value of the Navy surface diesel ship is clearly presented by Lieut. Comdr. John O. Huse, U.S.N., in an article "Diesel Driven Surface Craft", published in the November 1934 issue of U. S. Naval Institute Proceedings, from which the following is extracted:

"Our Navy, above all others, needs the diesel engine. The arguments for the development and adoption of all-diesel drive are more compelling in Washington than in London, Tokyo, Paris, Rome, or Berlin.

"Let us put diesel cruising drive in all new construction.

"Let us take the lead in the future development of the all-diesel man-of-war."

● Japan Building Diesel Ships

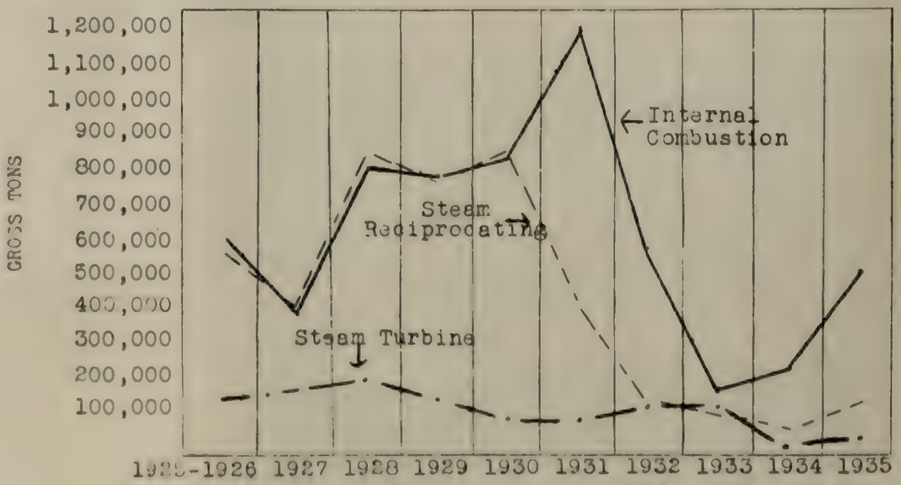
How other more war-minded nations appraise the war value of the diesel merchant ship is indicated by analysis of the Japan state aided scrap and build program, inaugurated October 1, 1932. Obsolete steamers have been replaced, largely, by modern, faster and more economical motorships. Out of 38 large replace vessels, 29 are diesel powered, and these represent about 85 per cent of the total tonnage. From 1926 to 1934 inclusive, in sizes from 6,000 to 20,000 tons, Japan built 52 diesel ships and 9 steamers, while the United States built 17 diesel ships, mostly tankers, and 49 steamers. In the next world war these fast Japanese passenger and cargo ships will each be the equivalent of three steamers as auxiliary war vessels on distant stations; because the diesel ship can remain away from its base longer without refueling.

What other principal maritime nations think of the war value of second-line merchant auxiliary diesel ships may be gained from the following table of launchings of diesel and steam ships of from 6,000 to 20,000 tons, from 1925 to 1934. In these important sizes the United States built 3 steamers to 1 diesel ship, while the rest of the maritime world built 3 diesel ships to 1 steamer.

● Urgent Need for Diesel Legislation

What is nobody's job is not done. New marine legislation should definitely place the responsibility of determining whether a ship which is to be built with government aid or subsidized in operation should be diesel or steam, depending on the type of ship, its size and the service for which it is intended.

Unless this is done we will continue to drop behind in marine progress. Data on actual operating economies of foreign diesel ships and the refinements in their design, especially relating to the utilization of diesel waste heat, is, naturally, not readily



Graph showing tonnage built for various types of prime mover.

obtainable from our marine competitors. Due largely to the support of the Shipping Board Dieselization Program, American engine builders are better prepared to supply modern diesels than American naval architects are prepared to design modern, highest economy motorships.

It is accordingly essential that a start be made without further loss of time. As soon as it becomes evident that the government will insist on highest economy diesel propulsion to compete with over 11,000,000 tons of foreign diesel ships, shipyards, naval architects and ship owners will take the necessary steps to produce American diesel ships equal to the best built abroad.

The American South African Line fine M.S. City of New York is one of the few ocean going combination cargo and passenger vessels under American flag.

Book Reviews

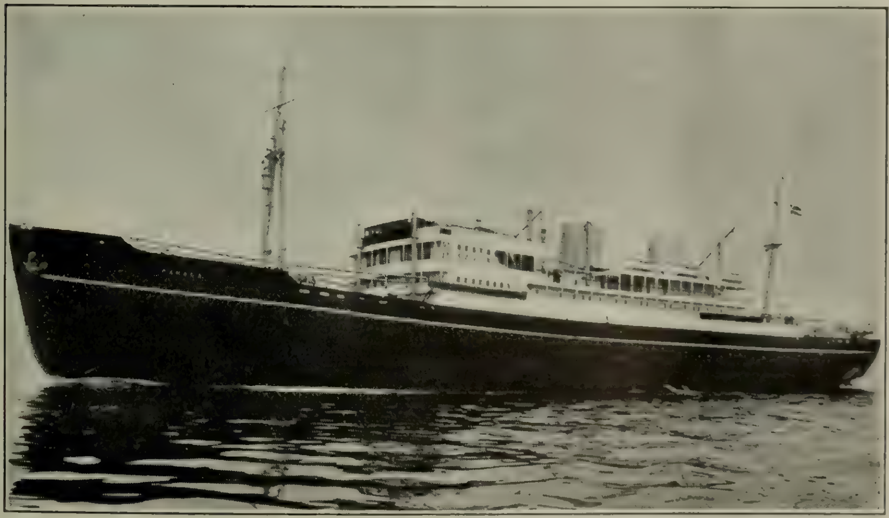
BROWN'S NAUTICAL ALMANAC, 1936: 755 pages of tables and diagrams, advertisements and advice; bound in stiff cardboard, published by Brown, Son and Ferguson, Ltd., Glasgow, S.I.; price 3 shillings net.

We are always glad to see this old friend, and to learn on glancing through its pages that, notwithstanding the conditions imposed on the Pacific Coast shipping industry by the Pacific Coast Federation of Maritime Unions—the celestial guardians of the shipowner, seaman, and ship alike are expected to be as regular in their habits next year as they have always been in the past. These good old standbys—Jupiter, Mars, Venus, Saturn, the Pole Star, the sun, the moon, and all the hosts of heaven—are still faithful to their agreements. They never repudiate.

Kempe's Engineer's Year-Book, 1936. 2668 pages with numerous drawings, tables and diagrams handsomely bound in red with gold stampings. Published by Morgan Brothers, Ltd., 28, Essex Street, Strand, London, W.C. 2. at 31/6d. net.

This is the 42nd annual edition of a reference book which deals with all phases of modern engineering practice, and which is extensively used in all branches of the industry. The book has again been carefully checked and revised and a considerable amount of new material has been added, including an entirely new section dealing with Acoustics, Vibration and Noise—subjects of increasing importance to all engineers. Important additions have also been made to the sections dealing with Steam and Electrical Engineering.

The Trade Descriptive Sections have once more been extended, and contain full particulars of various products of a number of engineering firms.



Danish-East Asiatic Company's fine cargo and passenger motor carrier Canada is a recent addition to the Pacific Coast-European service.

Trade Literature

Goetze Gaskets. A handsome profusely illustrated catalogue of 65 pages describing and pricing a complete line of metal and metal jacketed gaskets, sealing compounds, metallic and non-metallic packings, filter screens, shims and metal stampings as made by the Goetze Gasket and Packing Company, New Brunswick, N.J.

Welded Piping and Pressure Vessels in the Marine Field

By James W. Wilson*

Engineer, Bureau of Navigation and Steamboat Inspection, Department of Commerce, Washington, D. C.

The trend to higher pressures and temperatures in the marine field is ever increasing, the highest pressures on American vessels now in operation being 450 pounds per square inch, the total temperatures ranging from 700 to 750 degrees Fahrenheit. Recently, designs were approved for an installation operating at 550 pounds W. S. P. and a total temperature of 800 degrees Fahrenheit. One of our leading shipyards is now working on designs for a ship which is intended to operate at 1200 pounds W. S. P. and a total temperature of 850 degrees Fahrenheit, hence the necessity for improved methods of fabrication in which fusion welding seems destined to displace existing methods of construction.

Welded boilers and pressure vessels have been approved by the Bureau of Navigation and Steamboat Inspection for the past year, several boiler installations have been made and are operating successfully. No difficulty has been experienced in their manufacture or operation, and no work has had to be rejected. Moreover, a number of welded unfired pressure vessels, such as fuel oil and feed water heaters, evaporators, and separators, have been installed, and it is gratifying to note that, as in the case of the boilers, no difficulty or defects have been detected. The record to date reflects great credit upon the manufacturers of such equipment for their cooperation in endeavoring to furnish dependable products. From my experience, I have no hesitation in saying that the ship-owners and ship-builders who have pioneered in the introduction of welded equipment in the marine field are very enthusiastic about its performance under service conditions, and in my contact with them I am advised that when new equipment is ordered, welded construction will be specified. All of the boilers and pressure vessels referred to were constructed in accordance with the requirements of the Welding Code of the Bureau which was developed by a sub-committee of the Committee on Welding in Marine Construction of the American Welding Society.

● High Pressure Piping

At the present time there is an insistent demand and urgent need for extending this Boiler Code to include high pressure piping, that is, piping subject to boiler pressures and temperatures. The Code as it now stands permits welded piping for 100 pounds per square inch only. The successful use of welded boilers and pressure vessels, together with the fact that experimental work has been done along these lines, seems to justify the development of a code for the welding of high pressure piping in position on shipboard. The Committee on Welding in Marine Construction is at present giving this matter careful thought and study, and in the near future meetings are to be held to attempt to get together on a safe and dependable code. It is perhaps the most difficult problem which this Committee has had to solve as yet, and upon the success or failure of such a code will depend to a great extent the future of the art of fusion welding in the marine field.

It is a fact that many large power stations ashore are operating successfully with welded piping on heavy pressure lines, but one point that cannot be ignored is that marine piping is subjected to a harder usage than is piping in stationary plants. All marine engineers will agree on this point, for not only are there the usual stresses of pressure, temperature, expansion and contraction, and vibration, to contend with, but also the indeterminate stresses placed upon the piping due to the pitching and rolling of a vessel in a seaway, which impose severe twisting, buckling, bending and pulling stresses, or to the impact resulting from a grounding of a vessel. Therefore, the subject is one that must be approached with extreme caution. Another difficulty to be dealt with is the fact that two of the major safeguards of fusion welding have to be sacrificed in its application to piping, namely, the X-raying of the welded joints to determine their soundness, and the stress-relief of the piping under ideal conditions in an annealing oven.

● Welded Pipe Experience

The only precedents covering the use of welded marine piping of which I have any knowledge are the piping on the steamship Dixie and on certain modern liners built for the Grace Line. Let us consider the case of the Dixie first. On October 21st I made a survey of this vessel, which recently grounded in a hurricane on French Reef in Florida Straits, and found that, although this vessel has been in continuous service for a period of ten years and the stresses placed upon the piping while the vessel was being pounded on the reef were terrific, nevertheless the piping remained intact; not a weld cracked, nor were there any signs of leakage or distress of the joints.

It may be well to describe briefly the type of joint used on the Dixie. It is a combination screwed thread and welded joint, the end of the pipe being screwed into the flange and the lip of the flange being welded to the wall of the pipe. The welding was done by the gas process and was supervised by the experts of one of the large acetylene welding companies.

The piping on the Grace Line ships previously referred to comprised the astern inlet pipes to the turbines only. These pipes were welded by the butt-weld method, some by the gas welding process and others by the electric-arc process. The welding was performed in the shop in accordance with the A. S. M. E. code requirements for Class I welding, it being possible in this case to X-ray the welds. This piping has been in service for about four years without trouble of any kind.

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*Read at the 36th Annual Convention, International Acetylene Association, Cleveland, November 12, 13, 14 and 15, 1935.

● Proposed Piping Code

It is my thought that, in developing such a piping code, drastic qualifying tests should be prescribed for the welding operators; that special attention should be given to the selection of welding rods, and that only the best quality of high test welding rods should be permitted. It might be necessary for the Bureau to establish an approved list of welding processes and procedures to insure safe welds. It should be the aim of the Committee to endeavor to secure welded joints which would have as nearly as possible the physical characteristics of the base metal. The test specimens should be welded in position without turning the pipe, welds being made vertically and horizontally. The tension test specimen should be tested in the full section of the pipe, particular attention being given to securing complete penetration. It would be most desirable if some reasonable means could be devised as a substitute for the X-rays to determine the soundness of the joints. It is my belief that all of these features will be carefully considered by the Committee and that from the study and research that have been made it will be possible to develop a safe and dependable code for the welding of high pressure piping.

Echoes from the Fishing Banks

Workboat owners of the Pacific Coast are watching with great interest the performance of the reconditioned International No. 5—fishing boat extraordinary of the International Fish Company. A right tight little vessel, International No. 5 was recently rebuilt as to superstructure and deck. Her house was streamlined, she was fitted with a new Enterprise diesel and equipped with an electric Automatic Pilot and the new model Fathometer for small and medium sized vessels.

This model of the well-known echo depth sounding device was especially designed and developed by the engineering staff of the Submarine Signal Corporation to meet the need for a device of this character that could be installed at less cost and yet furnish soundings of ample accuracy for safe navigation and for exploration of bottoms up to several hundred fathoms.

First Pacific Coast installation on a fishing boat of the standard small model Fathometer was made in June, 1932 on the Catherine Paladini of A. Paladini, Inc., San Francisco, and was fully described in Pacific Marine Review for May, 1933. That installation was very satisfactory and was followed by several more on Pacific Coast fishing boats. On all of these boats, the hulls are heavily built of wood and on such hulls the transmitting oscillator and the receiving hydrophone for the Fathometer were installed in tubes set in holes bored through the planking. To cut holes through the planking of their wooden ships in order to install a device which had as one of its principal features an added guarantee of safe navigation did not appeal to the hard-headed fishermen.

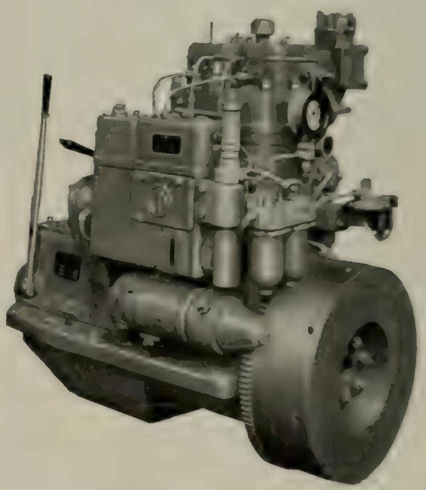
So the Submarine Signal Corporation engineers devised a new type of electric vibrator and receiver which could be fastened to the outside of the planking on these vessels and be installed at lower cost.

First installation of this type is that on International No. 5. It is functioning perfectly and is enabling that ship to find the fish banks promptly, to avoid holes in these banks that have in times past caused the loss of many valuable nets, and to navigate in fog with great certainty and safety.

The small type indicator used with these installations gives depth up to 250 fathoms on the automatic indicator or red light dial with 20 soundings per minute, while on the secondary dial and with the use of ear phones soundings up to 1000 fathoms may be had at the rate of four or more per minute.

The performance of this new model Fathometer on International No. 5 has resulted in a number of orders for similar installations on other boats. C. V. Lane represents the Submarine Signal Corporation at San Francisco.

A typical example of California's large fleet of modern diesel driven deep sea fishing craft.



New Atlas Model

Among small diesels developed during the past year is this new two cylinder Atlas, just announced by the Atlas Imperial Diesel Engine Company. This new engine has a 4¾-inch bore and 6½-inch stroke and develops 18 horsepower at 950 revolutions per minute. It incorporates the new Atimco fuel injection system which meters the fuel so accurately that no adjustments are necessary to equalize the power of the two cylinders. A descriptive bulletin is available on request to this magazine.

Pacific International Trade Review

● Far Eastern Economic Conditions

CHINA: The financial conditions at Shanghai remained unchanged during last week in November. Government bond prices are firm despite threat of difficult conditions in North China. Exchange rates are firm, owing to Government control and absence of speculative operations. China imports for the ten months of 1935 increased one per cent in gold unit value, but declined eieven per cent yuan value as compared with the same period in 1936. Exports decreased one per cent. The United States supplied ten per cent of China's imports and took twenty-four per cent of the exports.

JAPAN: Business is encouraged by larger foreign trade, higher commodity prices, expansion of currency, and the assurance of heavy budgetary allotments next year which will afford continued impetus to heavy industries.

PHILIPPINES: October business conditions were generally satisfactory but the textile trade was disappointing. Automobile and tire sales were good and flour and fish imports were heavy.

NETHERLAND INDIA: The general economic situation continues unsatisfactory due to declining prices of export commodities, scarcity of money and partial crop failures. Exports of native rubber are heavy and general import trade is inactive.

BRITISH MALAYA: The tin market outlook is optimistic. Rubber prices were firm. October foreign trade gained substantially.

● Recent Changes in Tariffs

Petaluma's white leghorns or any other American hens, should they so desire can now get into French Indo-China alive at reduced tariff rate. Division of Foreign Tariffs, the Bureau of Foreign and Domestic Commerce, the United States Department of Commerce will be glad to furnish details gratis.

Chilean import duty on incandescent electric light bulbs was drastically increased effective September 24, 1935. Duty on Edison screw base type bulbs of voltages from 100 to 250 was upped from 0.35 pesos to 3 pesos per gross kilo which would multiply present duty by 8½.

Effective October 19, 1935, Guatemala reduced by approximately 38 per cent the export duty on chicle. Perhaps this might bring an order for a sea-going yacht from some American chewing gum magnate.

Mexico has somewhat reduced import duties on both silent and sound moving picture films, effective October 24, 1935.

APPOINTED FOR MERIT

The Acting Director of the Bureau of Foreign and Domestic Commerce in Washington, N. H. Engle, recently announced the appointment of John J. Judge as District Manager of the District Office of the Bureau in San Francisco.

Mr. Judge was born in 1895. After leaving school he became associated with the Boston & Maine Railroad. His business career was interrupted by military service on the Mexican Border and in the World War. In 1921 he came to Berkeley and attended the University of California specializing in foreign trade. Upon completion of his course in 1925 he accepted a position with the Bureau of Foreign and Domestic Commerce. A year later he was assigned to the San Francisco office as Commercial Agent, was later promoted to Assistant District Manager and now after over nine years of active service on the Pacific Coast has been appointed District Manager.

The San Francisco District Office is one of twenty-five such offices maintained by the Bureau of Foreign and Domestic Commerce in the United States. The offices make available to manufacturers and exporters domestic marketing data and vital export information, special commodity reports and in short, act as a clearing house for all business facts collected by the far flung agencies of the Federal Government in all parts of the world.

● Non-Balanced Trade

During the first eight months of 1935, the United States bought from British Malaya products (chiefly rubber and tin) valued at $91,016,500. During that same period, United States sold to British Malaya only $2,873,000 worth of merchandise. In the total international trade of the United States there are only three countries from whom we buy more than from British Malaya. These are Canada, Japan and United Kingdom.

On a value basis, British Malaya ranks fourth in the countries from whom United States imports goods and 44th in the countries to whom we export.

This excess of imports over exports is heavier than our unfavorable balance for any other country for the same period. We are British Malaya's best customer and we should be able to sell her more of our manufactured products in exchange for her raw products.

Dahlias from California were on exhibition in Australia at the annual spring show of the Newcastle District Horticultural Council. The dahlias, more than a foot in diameter, were embedded in ice to permit their transport from the United States to Newcastle.

It is claimed the show is the first in Australia to attract flower exhibits from overseas.

More than forty years ago Australian wildflowers were packed in ice for transmission to Queen Victoria. —Australian Press Bureau.

Anzaks Like Autos. During the first nine months of 1935, New Zealand imported 14,805 motor vehicles compared with 8762 in 1934 and 2250 in 1933. A little over half of these cars were assembled passenger autos, of which Great Britain supplied 5,025; Canada, 2075; and the United States, 830. Of unassembled passenger cars 3306 came from the United States, and 1431 from Great Britain. United States led also in the unassembled trucks and busses. This business is expanding and should be cultivated.

Peruvians Motorizing. With favorable prices for her cotton and silver and a more stable government Peru is taking more interest in American autos. She bought 1198 passenger cars, 1386 trucks and 100 busses in the first nine months of last year thereby registering a gain of nearly 70 per cent as compared with the same period in 1934. The high cost of gasoline is an unfavorable factor and diesel engined trucks are favored.

Malaya Wants Cars. The year 1935 was good in Malaya, and during the January-September period she imported 4624 passenger cars, an increase of 81 per cent, and 1874 commercial vehicles showing a gain of 130 per cent, as compared with 1934. United States is gaining in this market and should continue to gain as she is the world's best customer for Malayan products. Malaya is also importing American polo ponies, and a large dairy on the outskirts of Singapore uses exclusively American cattle. We bought over 100 millions worth of Malayan products in 1935 and sold them less than 4 millions.

Flivers in China. During the fiscal year ending in 1935, China imported 3635 passenger cars of which 3014 or 82 per cent were American, and 3717 motor bus and truck chassis of which 94.9 per cent originated in the United States. There has been a steadily growing increase in this business since 1932, and it is now considerably ahead of the peak year of 1929. Previous to 1931 most of the American contact was through assembling plants in Japan. In that year the direct shipments began and the Japanese share of the business immediately dropped from about 35 per cent to less than 2 per cent.

Less Tax in Java. The Netherland India new system of motor vehicle taxation provides a uniform indirect tool from vehicle owners by means of an excise tax on motor fuel. This new tax was put in force, January 1, 1935, displacing the heterogenous multiple taxes by municipal and provincial authorities and resulted in a 40 per cent increase in car registrations during the first quarter as compared with the same quarter in 1934. Sales of American cars increased 80 per cent. There were 3626 new cars registered between December 31, 1934 and March 1, 1935.

Pacific Air Lines and Foreign Trade

(Continued from Page 44)

bring in the exchange of monies, securities, documents and other papers of similar nature. Considering speed and convenience of credit transactions alone, the new service should be worth to American business many, many times the millions it has cost to bring the line into operation.

America so far has a marked advantage over her competitors. We can get the orders faster by plane and deliver them faster by steamer, whether it be a dozen locomotives or a gross of hairpins.

The airplane is distinctly not a competitor of steamer service; rather, it is an adjunct, helping to increase our foreign trade which in turn will call for the carrying of additional freight. There is not and should not be any jealousy between the two means of trans-oceanic transportation. As each improves it will help the other. Between them, America has what it needs to profitably compete in the Far East.

The question of how much our share of this seven billion dollar market is to be rests with the businessmen of America. I believe it can safely rest with them. I believe they will quickly recognize the potentialities of invading the markets of the Orient by air, sending their salesmen and samples, opening branch offices in key foreign centers, showing the enterprise and spirit of those merchants who made the first clipper age so outstanding.

Today America stands on the threshold of a new foreign trade expansion. I repeat that the extent to which we succeed in profiting from present developments lies with our businessmen. The market is there. The means of reaching it ahead of our competitors is there. The nation is geared for production.

From this point on our foreign trade rests directly with the initiative of the American business world.

We are entering the great second clipper age of American foreign trade.

[Extract from an address on the occasion of the China Clipper Trans-Pacific flight.]

Morro Castle Onus. On January 25, a Federal jury, sitting in New York, rendered a verdict "Guilty of criminal negligence" in the case of the steamship Morro Castle, gutted by fire with great loss of life during September, 1934. The persons so held responsible were William F. Warns, acting captain; Eben S. Abbot, chief engineer; and Henry C. Caband, vice president of the New York and Cuba Steamship Company, owners of the vessel.

China Clipper over the Port of Oakland, Calif.

The American Merchant Marine

(Continued from Page 48)

1855—The political turmoil of this period directly caused the disappearance of American ships in foreign trade. The shipowners receiving the mail contracts were located in the north. The slavery feud incensed the south. Southern democrats, then in power, reduced and nullified the effect of the 1845 Mail Subsidy Act. Both northern parties condemned this action as blindly sectional and disastrous.

1858—All mail subsidies were withdrawn completely. American ships, superior to the British ships, were sold, the best of them to the British. American shipyards, building iron ships, boilers and machinery fully on a par with anything built foreign, were forced out of the running. The British mail subsidies won.

A. A. Low, shipowner and merchant, in a formal statement to Congress, said "The English have deliberately and intentionally driven the Americans from the ocean by paying subsidies which they knew our Congress would not pay. . . . They have driven us from the ocean by that policy just as effectively as they ever did drive an enemy from the ocean by their guns."

Admiral Hilary P. Jones, U.S.N., retired, recently stated: "If the United States government had pursued a policy of subsidy to merchant ships for a period of 50 years before the outbreak of the World War, approximately two billion dollars of the three billion dollars spent on merchant ships could have been saved."

From 1855 to 1891 nothing was done to revive American shipping in foreign trade.

1872—Congress passed a law to pay American ships full postage on mails carried. This has not been done. In fact, some statements have been made exulting over the fact that on some routes the mail contracts have saved the government money due to the poundage earnings being greater than the contract payments. Sea postage averages 44 letters to one pound. At 5c per letter this is $2.20. American ships carrying mail on the poundage basis, while not under mail contract or subsidy agreements, receive 5c per ounce, or 80c per pound. Foreign lines receive the International Postage Union rate, 35c per pound.

1880—Since this date the democratic party has continually held that fostering the growth of an American merchant marine is necessary to develop and strengthen commercial relations, binding us to our sister republics to the south.

1884 — The Republican party followed suit and practically ever since has held a platform strenuously declaring for an adequate American merchant marine.

1891—The Senate passed a postal subsidy Act for liners and a navigation bounty for cargo ships. Peculiarly, the ones actually most concerned, the south and middle west, first to suffer when there is a scarcity of ships, through their representatives, so emasculated this Act that it accomplished next to nothing. Two ships came in under the American flag from the British flag and two ships were built, the four running in the transatlantic trade. The service Pacific Coast-Australia was resumed. That was practically the sum total accomplished by this Act. The measure was timid in the extreme. The mail pay was too low to offset foreign low cost competition.

1904—After a thorough study, the Merchant Marine Commission recommended to Congress: (1) National encouragement to liners; (2) Naval Reserve pay to officers and men; (3) Five dollars per gross ton navigation bounty to cargo liners.

These recommendations were passed by the Senate. The House killed the cargo ship bounty. Two filibustering retiring Senators buried the balance of the measure. Again Congressmen from the south and middle west, stated to be ably assisted by strong European steamship corporations, led the opposition.

1912—Under the Panama Canal Act a special provision permitted free entry to foreign-built ships under five years of age. It is estimated that fully two-and-one-half million tons of foreign ships were owned by American capital. Practically no ships were naturalized under this Act. Foreign ships were so much cheaper in cost and operation that it was economically unsound to change the flag.

1913—Congress enacted a five (5%) per cent discriminatory duty, favoring American ships. The United States Attorney General declared this law violated treaty obligations, so it was never enforced.

1914—Congress passed the Emergency Ship Registry Act, removing the age limit of the 1912 Act. By reason of the World War freight rates jumped and war bonus wages to crews on foreign ships crept up to near the American level, making it economically possible to compete. Hence undoubtedly to secure protection under a powerful neutral flag, 171 ships, aggregating 583,733 gross tons, became naturalized.

1915—The Seamen's Act became law. It was designed to equalize wages on foreign ships by practically inviting crews of these ships to desert in American ports, thereby forcing foreign captains to hire new crews at American wages. In actual practice this, of course, did not work out. This law did, however, increase crew requirements, and, by forcing payments of wages in foreign ports, undermined discipline, causing delay to sailing of ships by drunkenness and failure to be on board at time required. Such behavior assuredly is not in keeping with our national dignity. We who have been agents for American ships in foreign ports, have authoritative experience in this regard. This Act served to arrest the naturalization of additional foreign-built but American-owned ships under the 1914 Emergency Act. It also served to eliminate American ships in the trans-Pacific trade. Only the abnormal earnings of the war period, the Shipping Board operation after the war, and the mail contracts after 1928, enabled American owners to meet these conditions. The American Shipowners Association has suggested some modification of this law. It has been duly tried and found harmful in some aspects, both to the crew, officers, ships and owners, as well as causing conduct not becoming American citizens in foreign lands.

1916 — The Shipping Act passed was essentially a peacetime legislation. Scarcity of American ships, which caused untold harm to farmers, manufacturers, shippers, and the general public, forced action. This Act stated a broad national shipping policy, created the United States Shipping Board, and was the first step in constructive legislation to revive American-built, -owned and -operated ships by purchase, charter or otherwise; and ships procured were to be privately operated. The law provided that the vessels acquired by the Shipping Board should not be operated by "any corporation in which the United States was a stockholder." The Shipping Board was also clothed with regulatory powers over American shipping, much on the order of regulation by the Interstate Commerce Commission over railroads.

1917—By the declaration of war on April 6th, the Shipping Board became, overnight, an instrumentality of war instead of a regulatory peace body. With Congressional and Presidential approval, the Shipping Board created the Emergency Fleet Corporation, with a fifty million dollar capital stock, to purchase, build and operate ships.

The President received Congressional authority to confiscate all interned enemy ships, whereby 95 German and Austrian ships of 575,802 gross tons, or 607,500 deadweight tons, were taken over. Enemy sabotage damaged these ships badly but American engineering skill soon had them repaired and, ironically, enemy ships carried a great portion of our troops to France, the Leviathan alone taking 95,000 over and bringing 97,700 back.

Authority also was given to requisition all shipyards and their contracts. The British had orders in American shipyards for over one million tons of ships. Norwegian capital had been invested in shipyards and in ships. By this act 413 ships of 2,937,808 deadweight tons, mostly for foreign account, became United States property.

German submarines were sinking allied shipping to an alarming extent. Our allies urged ships, ships, and more ships. Every effort was made to comply. From a low average, as compared with the rest of the world, in ten months we jumped to first place. An epic period of ship construction never before equalled set in. In April 1917 there were 44,000 shipyard workers. By November 1918 there were 381,000 men employed in shipyards and 200,000 men in allied trades, all producing ships.

$167,000,000 were spent in building shipyards alone. The Hog Island yard, the greatest shipyard ever erected, cost $66,000,000 and employed 41,000 men, nearly as many as the total men employed by all yards in April 1917.

When we entered the war all shipways were fully employed. Seventy per cent of our total shipyard capacity was taken for Navy use. Expansion was necessary. In April 1917 there were 61 yards with 234 shipways. By November 1918 we had 223 shipyards with 1099 shipways.

Drydocks, marine railways, outfitting docks, repair yards, all had to be built.

Housing had to be provided for the men. $75,000,000 were spent for this purpose.

Transportation facilities for both men and material had to be provided.

Labor costs rose more than $300,000,000 in the first year, over prewar costs for the same work.

The second year was even higher.

Five hundred and twenty (520) contracts were let for 3115 ships — steel, wood, concrete—with a total of 17,276,318 deadweight tons, including commandeered ships.

Holland ships, laid up in America, were seized and employed. Holland feared powerful Germany and dared not sell or charter.

Sixty-eight (68) ships were procured from Japan, 23 under charter, 15 purchased, and 30 built under order, for which the United States furnished the steel.

Four ships were built in China, where material was also furnished. A great number of ships were built on the Great Lakes, mostly limited to size because of the need of traversing the Welland Canal. Twenty-three (23) ships were cut in two and rejoined after the two halves had been separately towed through the canal.

The war left us 2434 ships of 13,885,106 deadweight tons, of which 1689 were steel ships of 11,559,000 deadweight tons. The balance of the 3115 ships ordered were cancelled when armistice was declared. Of the 1689 ships only 26 were designed as passenger ships, the balance being mainly 9½ to 11 knot freight ships, which presently is a totally inadequate speed for our purposes.

The total sum spent in this shipbuilding orgy was $3,671,000,000. The actual amount spent on ship construction was $2,861,755,570 for 2434 ships of 13,885,106 tons, averaging $206 per deadweight ton.

The tremendous expansion of ships required trained men. Men from allied trades, bridge builders, steel workers, machinists, and the like, were given intensive training at special schools.

Thirty-two (32) training schools were set up all over the United States for ships' officers.

Eight (8) engineering schools were established.

Numerous training camps and training ships were provided to train seamen, firemen, stewards and cooks.

Recruiting stations were provided.

No effort or expense was too great to fulfill the program. It was costly but the results were correspondingly great.

Steel jumped to three times the normal cost and labor doubled in cost. Shipbuilding was expanded tenfold in ten months. The average tax paid by shipbuilders was $25 per deadweight ton; hence, it is calculated that the actual cost was $180 per deadweight ton.

1918—By Congressional action the President was given plenary powers for the period of war and nine months thereafter over the entire shipping industry. These powers were delegated to the Shipping Board and the Emergency Fleet Corporation.

1920—Out of a peacetime measure grew the gigantic war organization of the Shipping Board and the Emergency Fleet Corporation. The modest fleet contemplated became, in less than two years, the second only to the British mercantile fleet. This American merchant marine was necessarily developed along military rather than commercial lines. Some thought was given to the type and size necessary after the war, but the object was to "Win the War" and time was the prime objective. Economy of building and operation was considered but could not be taken into account.

When armistice was declared the ships were needed to supply a world wanting our goods. Farmers and

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Marine Insurance Review

Better Fog Signals Needed

Some Lessons to be Learned from the Collision Between the Hubert Schafer and the Leme

By David W. Dickie

The collision between the Italian Motorship Leme and the Pacific Coast steel lumber carrier Hubert Schafer occurred in a thick fog about six miles north of Point Arguello and as usually reported in collisions the fog signals in each case were not located definitely by the other vessel until they were too close to avoid doing some damage.

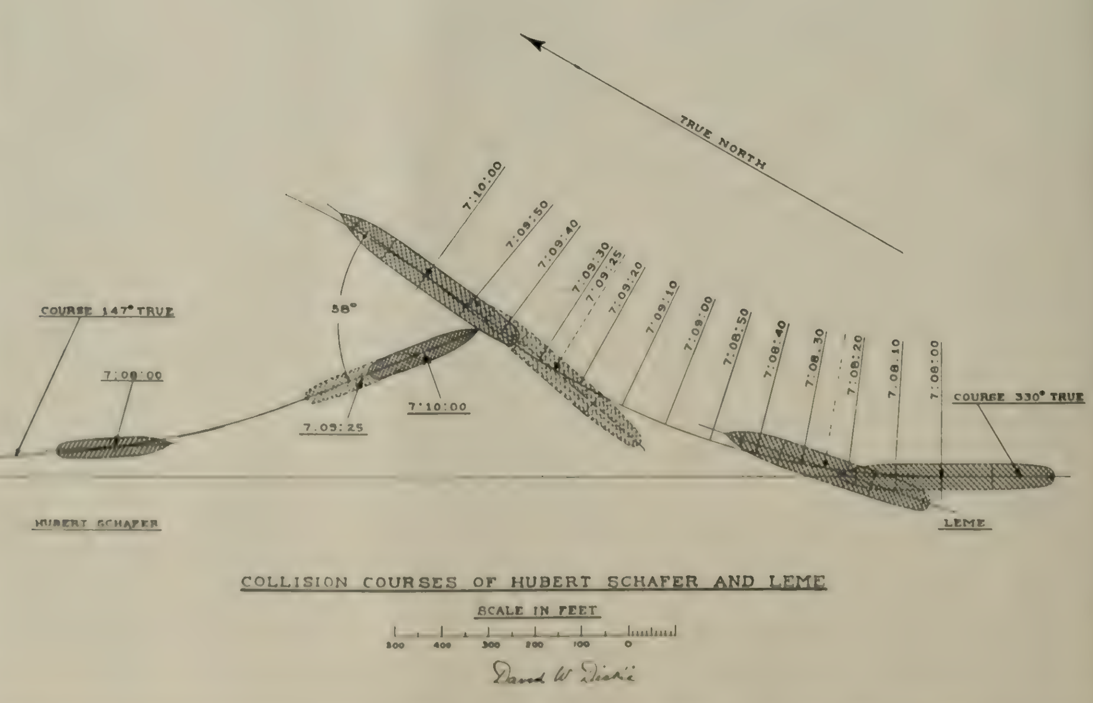
If commerce is to benefit by employing modern merchant vessels of greater speed it is extremely important that some means be devised for receiving and amplifying fog whistle signals so they can be located at least with respect to direction. If this cannot be done some research may be necessary along the line of having ships that are navigating in fog send out a faint radio signal that can be heard with a direction finder for a distance of say ten miles. A vessel would then know whether another was directly in her path. Otherwise in regions like the Pacific Coast where fog is prevalent the benefit of high speed will be seriously curtailed as the ships cannot maintain fast schedules.

Theodore M. Levy acted as Proctor for the Leme and Harrison Jones represented the Hubert Schafer in taking depositions of the personnel of the two vessels.

The Leme heard one faint whistle slightly on her port bow two minutes before the collision. Her speed had been reduced some time previously to 6 knots and she turned "Hard Right" upon hearing the whistle. About one-half minute before the

HUBERT SCHAFER

SECONDS TO STOP	SECONDS FROM REVERSE SIGNAL	FEET TO STOP	FEET FROM REVERSE SIGNAL	SPEED IN KNOTS PER HOUR
195	0	1346	0	9.25
185	10	1191	155	8.58
175	20	1053	293	7.84
165	30	928	418	7.23
155	40	813	533	6.76
145	50	706	640	6.12
135	60	607	739	5.58
125	70	516	830	5.09
115	80	433	913	4.61
105	90	358	988	4.16
95	100	291	1055	3.72
85	110	232	1114	3.30
78.4	115.6	203	1143	3.07
75	120	180	1166	2.89
65	130	135	1211	2.48
55	140	96	1250	2.08
45	150	64	1282	1.70
44.5	150.5	63	1283	1.68
35	160	39	1307	1.32
25	170	21	1325	.94
15	180	10	1336	.57
5	190	2.5	1343.5	.20
0	195	0	1346	.00



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collision the Hubert Schafer appeared out of the fog on her port bow and the Leme turned "Hard Left" almost but not quite avoiding the collision.

The Hubert Schafer had likewise been proceeding at "Slow" and two minutes before the collision and when the Leme's whistle was heard stopped her engines. Both vessels seemed to agree on this time. When the Leme appeared out of the fog directly in her path she attempted unsuccessfully to come to rest by putting her engines "full astern".

In laying off the courses of both vessels and the deceleration of the Hubert Schafer it soon became apparent that the stories no matter how authentic did not fit.

1. The Hubert Schafer could not have been at any appreciable angle on the port bow of the Leme and the fog whistle heard on the Leme must have been an echo from a fog mull or patch of greater density than the surrounding water vapor.

2. The vessels were very much closer than the whistle signals indicated.

3. The Hubert Schafer must have drifted off her course shortly before the collision.

The Leme maintained a constant speed of six knots over the interval we are interested in and in the two minutes preceding the collision must have gone "hard right" for 1 minute 25 seconds, than "hard left" for 35 seconds to make her course possible mathematically.

The angle between the vessels at the time of the collision (58 degrees) was fixed by the character of the damage, the bow of the Hubert Schafer coming in contact with the port side of the Leme about 68 feet from the stern.

Once the angle between two ships in contact is fixed either one or both have changed from previous courses, if necessary to make the contact angle possible. If it is physically impossible for one ship to perform the total angular change in the time and distance then the angular change must be divided and assigned to each ship in amount consistent with other circumstances.

The course of the Hubert Schafer one hour previous to the collision was noted but the log was silent from that time until the vessel was put under way again after the collision. Her speeds were "slow" four minutes before the collision, "stop" 1½ minutes before the collision and "full astern" one minute before the collision.

The deceleration of the Hubert Schafer was calculated for the interval between seven minutes previous to and the time of the collision and while the calculations agreed with the deceleration experiment when corrections were made for difference in draft, displacement and other conditions they did not fit the collision showing there was an error in the times due no doubt to the custom of recording time to the nearest minute, ignoring seconds.

The factor that finally determined the times and speeds correctly was agreement upon the part of both vessels as to the distance apart when they first sighted each other. Since the speed of the Leme was constant at six knots the elapsed time between the sighting of her bow by the Hubert Schafer and the moment of impact was determined by the time for the Leme to travel the known distance from her bow to the wound.

The Hubert Schafer, therefore, must have traveled the distance between the vessels upon sighting in the time determined by the previous calculation. Relating the time and distance gave her average speed and by finding the place on the Full Astern Deceleration table where the average speed coincided with the average speed of the above calculation it was possible to plot the whole story in so far as speed, time and distance are concerned.

No confirmation of a change in course was given by the Hubert Schafer but the Leme at a speed of six knots cannot cover the necessary distance or turn through a large enough angle in two minutes to make contacting courses possible at 58 degrees.

On the drawing of the courses of the two vessels will be found the Deceleration Table for the Hubert Schafer proceeding ahead with her engines turning full astern. It was agreed that the Hubert Schafer sighted the Leme's forecastle when the vessels were 150 feet apart and due to the relationship of the course angles of the Leme the Hubert Schafer had 139 feet to travel in 35 seconds to make contact making an average speed of 2.351 knots. Reference to the table shows that the Hubert Schafer was proceeding through the water at a speed of 3.07 miles per hour when she sighted the Leme and at 1.68 miles per hour at the moment of impact. The stern of the Leme was swinging away from the Hubert Schafer at .99 of a nautical mile per hour at the moment of impact.

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Marine Insurance Notes

Watch Your Steps. In granting a decision in favor of the plaintiff in the case of McCann vs. Anchor Line, the court seems to have hit quite a blow at the time-honored custom of granting to friends of passengers free access to the ship at sailing time. Said he, "passengers like to have their friends see them off, and have come so far to expect it as part of the prerequisites of the trip that they would resent its denial in a way that would be serious to the line that undertook to deny it. It seems to us that for this reason, leave to visitors to go aboard is in the interest of the shipowner; it is a customary appurtenance of the passengers' privileges which he cannot safely refuse, which indeed is not extravagant to consider as one of the inducements that he holds out to them, and for which he is paid."

The case in point was that of a daughter of one of the passengers. She came aboard for the sole purpose of bidding her parent farewell. While walking toward her parent's stateroom, she caught her foot at the top of a companionway, was injured somewhat, and sued for damages. In the language above and following that line of reasoning, the court held

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that she was a business visitor, that the foot was caught because the companionway had been left "negligently out of repair" and that hence the shipowner was liable.

Total Loss Findings. On November 24 last, the British tanker, La Crescenta, belonging to the Crescent Navigation Company, left Port San Luis, California, for Osaka with a full cargo of crude oil. She was spoken on December 6, has not been heard from since. Judged a total loss, by the British Board of Trade, an inquiry was ordered. The evidence showed that the managing owners had not taken sufficient care to see that the ship was in a seaworthy condition. The court ordered the owners to pay 3400 pounds on costs. Of this, 2700 went to the Board of Trade and 350 each to the Officers Association and the Men's Union.

La Crescenta was built in 1923 by the Furness Shipbuilding Company at Haverton-Hill, England. She was 400 feet long, 53 feet beam and 35 feet 6 inches molded depth; carried 10,676 tons deadweight on a 28-foot 8 inch draft and had tank capacity for 65,465 barrels of crude oil. She had a single screw, triple expansion, steam engine; three single end Scotch boilers; and made 10 knots on a fuel consumption of 23 tons oil a day. She was built with the transverse system of framing.

L'Atlantique Insurance Settled. The French Court of Cassation recently dismissed the appeal of the marine insurance underwriters against the Dec. 24, 1934, adverse decision of the Appeal Court which upheld the previous order to pay off the Paris Tribunal of Commerce. The amount involved, about $10,000,000 with 6 per cent interest, was in fact paid under protest in 1934 immediately following the Commerce Tribunal Order. Claims of five salvage firms against the owners of this vessel for salvage in a total amount of approximately $3,250,000 are now in process of arbitration.

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Roman Firemen at Sea. Effective January 25, every new vessel must have installed all apparatus indicated in the regulations as necesssary to prevent fire and all new vessels over 6000 gross tons must carry from 4 (in the 1000-10,000 gross ton range) to 14 (in vessels over 40,000 gross tons) specially trained firemen, assigned to the care and use of this equipment. On vessels now in service, the installation of the apparatus must start within 3 months of the effective date of the decree. These rules apply only to ships carrying passengers. Any inflammable varnish in the interiors of any ship in service must be removed within 120 days.

Trade Literature

Bulletin W-321-B8. An attractive bulletin announcing a new Worthington Monobloc centrifugal pump, designed specially for hot well service and for handling liquids near their vapor pressures. Power plants, oil refineries, breweries, heating systems, air conditioning plants, chemical, refrigerating, and many other industrial plants use this type of pump for handling volatile liquids against medium heads.

These pumps are available for capacities of from 10 gallons per minute against heads of 50 to 110 feet with 12-inch submergence, to 175 gallons per minute against heads of 50 to 70 feet, with 60-inch submergence. They are compact, the greatest overall floor space required by the largest being only 24 by 16 inches. Copies of this bulletin may be obtained from this publication.

Bulletin W-210-B19 announces a thoroughly modernized non-deaerating type stationary feedwater heater developed by Worthington Pump and Machinery Corporation, builders of heat transfer equipment for the past forty years. This heater is for use wherever exhaust steam is available for heating boiler feedwater. Under ordinary conditions, a heater installation costing from $800 to $2200 will heat from 5000 to 40,000 pounds of water per hour. This means a saving from $817 to $6552 per year.

Some of the outstanding features of this heater are: A Worthington patented interchangeable pan system which provides a definite and unchanging flow of water in jets and drops, exposing maximum surface to the steam. Water is heated to within two degrees Fahrenheit of the saturated steam temperature within the heater.

Copies of this Bulletin may be obtained from Pacific Marine Review.

Economical Sectional Cabinets. After carefully studying the requirements of the shippers, transportation companies, boat builders, boat owners and ship yards and their method of handling small supplies, J. D. Warren Mfg. Co. found they were all in need of a medium size cabinet containing small drawers sub-divided into compartments providing a systematic method of arranging, stocking and handling small repair parts and supplies.

MARINE DEPARTMENT
Aetna Insurance Co.
Queen Insurance Co.
Maritime Insurance Co., Ltd.
Fidelity Phenix Fire Ins. Co.
Commercial Hull Dept.
Automobile Ins. Co.
MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at
Colman Bldg. Seattle
111 West 7th St. Los Angeles

Progress of Construction

The following Report Contains all the Data Available Concerning the Shipbuilding Work in Progress at the Leading Shipyards of the United States as of January 1, 1936

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: Order placed for **DD400** and **DD401**, two 1500-ton destroyers for U. S. Navy; no dates set.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Capac, S.S. Antigua, S.S. Alvarado, S.S. Maui, S.S. President Cleveland, S.S. Forbes Hauptman, S.S. President Johnson, M. S. California Standard, S.S. President Pierce, S.S. Chiriqui, S.S. J. A. Moffett, S.S. Manatawny, S.S. W. F. Burdell, S.S. Makura, S.S. President Coolidge, S.S. District of Columbia, S.S. President Monroe, S.S. K. R. Kingsbury, S.S. Talamanca, M.S. Sonora, S.S. West Planter, S.S. Chas. L. Wheeler, S.S. J. C. Fitzsimmons, M.S. Silvermaple, M.B. Kern, S.S. West Mahwah, S.S. F. H. Hillman, M.S. Iveaborg, S.S. Santa Elena, S.S. Nelson Traveler, S.S. Charcas, S.S. Argyll, S.S. Chas. L. Wheeler, S.S. Dillwyn, S.S. J. A. Moffett, S.S. S. C. T. Dodd, S.S. President Van Buren, S.S. W. S. Miller.**

FELLOWS AND STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Hull No. 637, Fellows-Craft V8,** cruiser for Fellows & Stewart, Inc.; L.B.P. 30′; beam 9′; loaded draft 2′3″; speed loaded 16 miles per hour; 90 i.h.p. Kermath V-8 gasoline engine; keel laid June 1, 1935, launched Aug. 1.

Four cruisers for stock; L.B.P. 30′; beam 9′, loaded draft 2′3″; speed loaded 16 m.p.h.; 90 i.h.p. Kermath V-8 gasoline engines; keels laid Oct. 10; 90 per cent complete, Jan. 1, 1936.

Hull No. 647, Fellows Craft Universal. L.B.P. 35′, beam 11′, draft 4′6″, sail area, 450 sq. ft., sloop rig; engines twin 30 horsepower, universal flexifour; keel laid November 25, 1935; estimated delivery March, 1936; 60 per cent complete Jan. 1, 1936.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS **Gas. S. Malta, S.S. El Segundo, Gas. S. Richness, M.S. Alaska Standard, Cutter Golden Gate.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Lurline, S.S. Steel Scientist, S.S. Makiki, S.S. Maui.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Brandywine, Sunset Barge C-1, Tug John N. Stewart, S.S. Mojave, M.S. Segundo, Tug Commissioner, S.S. Lawrence Philips, W. T. Barge No. 15, Whaler California.**

THE MOORE DRYDOCK CO.
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Transport Meigs, Tug Hercules, La Purisima, Margaret Dollar, Diana Dollar, Patterson, Frances, Barge Maltha, Great Western Barge No. 8, Pennsylvanian, Brunswick, Golden Dragon, Lochmonar, Carriso, Dredge A. Mackenzie, Dredge Culebra, Union Oil Barge 1922, President Cleveland, Scotia, Tosari, San Leandro, Davenport, Florence Luckenbach, Iowan, Frank G. Drum, Tulsagas, Charles R. McCormick, Gold King, Mexican, Virginia, Madrone, S. C. T. Dodd, Witell, Dispatch No. 3, Kentuckian, Daphne, Hawaiian, Hayward, Hamlin F. McCormick, Steamer James Griffiths.**

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: I **motor tug**—docked, cleaned, painted, misc. hull and engine repairs.

12 Ship Repair jobs not requiring docking.

33 commercial jobs.

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); LBP, 334′; beam, 35′ 1/8″; loaded draft, 10′10″; geared turbine engines; express type boilers; keel laid August 15, 1934; estimated launching, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); LBP 334′; beam, 35′⅛″; loaded draft, 10′10″; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; estimated launching, Dec. 31, 1935.

Two 1500-ton destroyers for U. S. Navy; order placed August 21 1934: **DD392, Patterson,** keel laid July 23, 1935; and **DD393, Jarvis**, keel laid August 21, 1935, estimated completion dates, February 1, 1937 and May 1, 1937, respectively.

Construction of **Destroyer No. 408** authorized.

Care and Preservation (out of Commission): **Aroostook, Jason, Kearsarge, Patoka, Pawtucket, Prometheus, Pyro.**

DRYDOCK, PAINT, MISCELLANEOUS: **Saratoga, New Mexico, Oklahoma, Arizona, Idaho, Swallow, Mahopac, Tatnuck, Challenge, Wando.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Absaroka, S.S. Charles Christenson, S.S. Edwin Christenson, S.S. Charcas, S.S. Condor, S.S. Jacob Luckenbach, S.S. Florence Luckenbach, S.S. Andrea Luckenbach, S.S. Point Ancha.**

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith**, Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery May 1937.

Sturgeon, Submarine (SS187); Order received September 9, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154′; beam 38′; two i.h.p. Atlas engines; keel laid May 25, 1935; launched Jan. 14, 1936; delivery date not given.

Hull No. 114. One purse seine boat; 82′ L.B.P.; keel laid September 1, 1935.

Orders received for **4 purse seine fishing vessels.** Complete data next month.

Atlantic, Lakes, Rivers

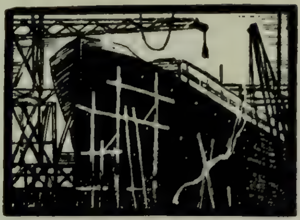
AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges;** 132′ x 35′ x 10′; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; 6 delivered; further deliveries before March, 1936.

Six standard steel coal barges, 175′ x 26′ x 11′ for Tri-State Transportation Inc.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hull No.



American Shipbuilding

Edited by M. J. Suitor

SUN SHIPBUILDING COMPANY HAS LARGE TANKER JOB

Sun Shipbuilding Company, Chester, Pennsylvania, is one of the busiest shipyards in the United States at the present time, with work beginning on four new single screw bulk oil tankers in addition to a building program which already included two ferries and two steam, single screw steel oil tankers.

Two of the four new jobs (Hulls Nos. 155 and 156) are being constructed at the order of Pan American Petroleum Corporation. They are 485 feet 6 inches in length; 68 feet beam and 37 feet depth; of 15,000 tons deadweight with one 4000 shaft horsepower cross compound double reduction geared turbine unit; and three water-tube boilers. It is estimated that the keel for Hull No. 155 will be laid on March 16; with launching date set for about September 19, 1936, and delivery October 10, this year. Keel for No. 156 will be laid at the same time as that for No. 155, but launching is estimated for October 31 and delivery for November 20.

Hulls No. 157 and 158 are being built for the Socony Vacuum Oil Company. These tankers will be built to the same specifications as those above with the following dates as to keel laying, launching and delivery: Hull No. 157: keel laying April 5, 1936; launching November 28, 1936; delivery December 14, 1936; and Hull No. 158, keel laying May 8, 1936; launching December 12, 1936; and delivery January 15, 1937.

The work already on hand at the Sun yard includes Hull No. 151, ferryboat Meadville, for the Erie Railroad Company. She has a length between perpendiculars of 234 feet; a beam of 45 feet; and a loaded draft of 18 feet 3 inches. She is powered by a 1700 indicated horsepower Skinner Uniflow engine with two watertube boilers and will make a speed loaded of 12 to 13 miles per hour. Keel was laid June last, and she was launched January 10 of this year. Delivery is estimated for sometime this month.

Hull No. 152, a steel, twin screw ferry to carry trucks, automobiles, and passengers for the Virginia Ferry Corporation will be launched on March 14 and delivered on March 31. Her dimensions are as follows: length 260 feet, beam 59 feet, and depth 19 feet 1 inch. She has two 4-cylinder Skinner Uniflow engines, each 1400 shaft horsepower, with two Foster Wheeler watertube boilers, cross drum sectional header type, 285 pounds pressure.

Of the two steam, single screw steel oil tankers building for the Gulf Refining Company; Hull No. 153 will be launched on April 27 with delivery on May 20; and Hull No. 154 will be launched on June 15, and delivered on July 6 this year. Keels were laid on November 15 and November 30, 1935, respectively. These tankers are 425 feet between perpendiculars; 64 feet molded beam; and depth molded to upper deck 34 feet; loaded draft 27 feet, 6 inches. Each vessel has one 2800 shaft horsepower Westinghouse cross compound double reduction geared turbine unit; two Foster Wheeler type A 3 drum boilers—400 pounds pressure.

● **Federal Shipbuilding and Drydock Company,** Kearney N.J., give March 1 as the estimated completion date of the two destroyers DD381, Somers, and DD383 Warrington. Tanker R. P. Resor has been delivered from this yard to Standard Oil Company of New Jersey and tanker T. C. McCobb is nearing completion for the same owner.

● **Marrietta Manufacturing Company,** Point Pleasant, West Virginia, has received order for three all-welded steel oil barges, 150 feet x 30 feet x 7 feet for export.

● **Western Boat Building Company,** Tacoma, Washington, has received order for four purse seining fishing vessels. Details will be forthcoming next month. Hull No. 112, freighter for Puget Sound Freight Lines, Seattle, was launched January 14.

● **United Drydocks, Inc.,** Staten Island, N. Y. reports that DD 364, destroyer Mahan, will be completed April 15. This vessel was launched October 15, 1935, keel having been laid June 12, 1934.

159, **Drayton (DD 366),** torpedo boat destroyer. U.S. Navy; keel laid, March 20, 1934; launching, no date set; estimated delivery April, 1936.

Hull No. 160, **Lamson (DD 367),** torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launching, no dates set; estimated delivery, June, 1936.

Hulls Nos. 161, 162, and 163; **DD394, DD395 and DD396;** Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively.

Hulls Nos. 164, 165, and 166, trawlers, single screw, steel, diesel propelled, for delivery in July or August, 1936, to Boston, Mass., owners.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA-39, Quincy,** 10,000 tons. Keel laid Nov. 15, 1933; launched June 19, 1935; estimated delivery March, 1936.

Heavy Cruiser CA44, Vincennes, 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD360, Phelps, keel laid January 2, 1934; launched, July 18, 1935; estimated delivery, February, 1936.

DD361, Clark, keel laid January 2, 1934; launched October 15, 1935; estimated delivery February, 1936.

DD362, Moffett, keel laid, January 2, 1934; launched Dec. 11, 1935; estimated delivery April, 1936.

DD363, Balch, keel laid, May 16, 1934; estimated delivery, June, 1936.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

CHARLESTON DRYDOCK CO.
Charleston, S.C.

DRYDOCK, PAINT, MISCELLANEOUS: Yacht Winyah, Dredge Howell, Yacht Clarinda, Tug Hinton, Launch Anna, Tug Wm. P. Congdon, Yacht Prosit, Yacht Nicoya, S.S. Shickshinny, Tug Waban, Launch Wando, Tug Santee, Tug Robt. H. Lockwood.

COLLINGWOOD SHIPYARDS, LTD.
Collingwood, Ont.

PAINT, DRYDOCK, MISCELLANEOUS:

S.S. Normac—Freight and passenger. Owen Sound Transportation Co. Ltd. Bottom damage repairs.

S.S. Dalwarnic—Bulk freighter. Canada Atlantic Transit Co. Ltd. Bottom damage repairs; new stern tube; painting, etc.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One yacht, L.B.P. 115′, beam 17′-6″, loaded draft 5′-6″; speed loaded 17 miles per hour; keel laid February 15; estimated launching October 15;** estimated delivery, April, 1936.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hulls Nos. 1237 and 1238, two steel hulls for towboats 169′ x 34′ 6″ x 7′ 2″ of 1540 gross tons.

Hull No. 1239, 1 steel coal barge, 160 x 40 x 16 for Oliver Transportation Co., Philadelphia, Pa., of 1100 gross tons.

Hulls Nos. 1240-1243, incl., 4 covered cargo barges 132 x 35 x 11 for stock, of 2072 gross tons.

Hulls Nos. 1244-1245—two welded towboat hulls 145′ x 32′ x 6′4″ for Pittsburgh Coal Co., of 600 gross tons.

Hulls Nos. 1246-1255, inclusive; 10 welded coal barges 175′ x 26′ x 10′8″ for stock of 4720 gross tons.

Hull No. 1256, welded steel towboat hull, 90′x22′x5′ for M & O Dredging Co.; Pittsburgh, Pa.; 135 gross tons.

Hulls Nos. 1257-1261, inclusive; five welded W-2 coal barges; 175′x26′x 10′8″; of 2360 gross tons.

Hulls Nos. 1262-1265 inclusive; four welded flush deck cargo box barges, 100′x26′x6′6″; 660 gross tons.

This makes a total of 30 hulls under contract, with a total gross tonnage of 13,278.

ELECTRIC BOAT CO.
Groton, Conn.

NEW CONSTRUCTION: Hull No. 19, **fleet submarine, Shark, (SS174): L.B.P. 298′; beam,, 25′; standard displacement, 1315 tons; keel laid, October 24, 1933; launched May 21, 1935; delivery, Jan. 1936.**

Hull No. 20, **Tarpon (SS175): L.B.P. 298′; beam, 25′; standard displacement, 1315 tons; keel laid, Dec. 22, 1933;** launched September 4, 1935; possible delivery, Feb. 1936.

Hull No. 23, **Perch, S.S. 176, building for U.S. Navy; keel laid, February 25,** 1935; estimated launching, May, 1936.

Hull No. 24, **Pickerel, S.S. 177 keel laid March 25, 1935; estimated launching,** June, 1936.

Hull No. 25, **Permit,** S.S. 178, keel laid June 6, 1935; estimated launching, August 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: **Two destroyers, DD368 Flusser and DD369 Reid for the U. S. Navy, estimated completion** dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington;** keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937.

Order placed for three 1500-ton destroyers; **DD397, DD398 and DD399;** no dates set.

MARIETTA MANUFACTURING CO.
Point Pleasant, West Virginia

NEW CONSTRUCTION: **One Steel Hull Anchor Barge, Hull Size 60′ x 22′ x 4′—with steel A frame, deckhouse, and machinery. To be built under contract with the U. S. Engineers Office at Vicksburg, Miss., and to be delivered at Vicksburg, Miss., in 90 days, contract** price $10,200.00. One pipe line dredge for U.S. Engineer's Office, Louisville, Kentucky. Completed and delivered.

One steel barge, 140′ x 34′ x 10′, of 6000 barrels capacity, for the Ashland Refining Co., Ashland, Ky.

Ten standard steel coal barges, 175′ x 26′ x 11′ for stock.

Three all-welded steel oil barges, 150′x30′x7′ for export.

TREADWELL CONSTRUCTION COMPANY
Midland and Erie, Pa.

NEW CONSTRUCTION: **six barges, 100′x26′x6′6″, for Treadwell Construction Company.**

One barge, 100′x24′x8′ for Parsons & Rader.

24 Barges 175′ x 26′ x 11′ for Marion Steam Shovel Co., Marion, Ohio, 15 delivered.

2 Oil Barges 195′ x 35′ x 9′6″ for Campbell Transportation Co., Pittsburgh, Pa., one delivered.

2 15-ton whirler derrick boats 85-foot boom for U. S. Engineers, Huntington, W. Va.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359 aircraft carrier CV5, Yorktown, for U. S. Navy; keel laid May 21, 1934; estimated delivery, October 3, 1936.**

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; estimated delivery February 3, 1937.

H361, light cruiser, CL47, Boise, keel laid Apr. 1, 1935; estimated delivery, August 22, 1937.

H362, light cruiser CL49, St. Louis; no dates set.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357); Hull No. 410, McDougal (DD358); Hull No. 411, Winslow (DD359);** of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; **Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43),** and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge,** Feb., 1936; **DD358, McDougal,** Apr., 1936; **DD359, Winslow,** June, 1936; **CL42, Savannah,** Aug., 1936;**CL43, Nashville,** Dec. 1936; and **CL46 Phoenix,** August 1937.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 1063, Nantucket Lightship No. 112,** building for U.S. Dept. of Commerce—Bureau of Lighthouses; L.B.P. 121′-6″, beam 31′, loaded draft 13′, compound engine, 600 i.h.p., 2 watertube boilers, pressure 165 pounds, keel laid July 17, no further dates set.

SUN SHIPBUILDING COMPANY
Chester, Pa.

NEW CONSTRUCTION: **Hull No. 151 Meadville,** ferryboat for Erie Railroad Co.; L.B.P. 234′; beam, 45′; loaded draft, 18′3″; speed loaded 12-13 m.p.h.; 1700 i.h.p. Skinner Uniflow engine; 2 watertube boilers; keel laid June 10, 1935; estimated launching, Jan. 10, 1936; estimated delivery, Jan. 26, 1936.

Hull No. 152—steel, twin screw, truck automobile and passenger steamer for Virginia Ferry Corporation. Length 260 ft., beam 59 ft., depth 19 ft. 1 in. 2 4-cylinder Skinner Unaflow engines—each 1400 S.H.P. 2 Foster Wheeler Water Tube boilers, cross drum sectional header type 285 pounds pressure. Estimated date of keel laying Oct. 15; launching March 14; delivery March 31, 1936.

Hulls No. 153-154—steam, single screw, steel oil tankers for Gulf Refining Company. Length between perpendiculars 425 ft., beam moulded 64 ft., depth moulded to upper deck 34 ft., loaded draft 27 ft. 6 in. Each vessel: 1 2800 S.H.P. Westinghouse cross compound double reduction geared turbine unit; 2 Foster Wheeler type A 3 drum boilers—400 pounds pressure. Estimated dates for No. 153. Keel laying Nov. 15; launching Apr. 27, 1936; delivery

May 20, 1936. Estimated dates for No. 154: Keel laying November 30; launching June 15, 1936; delivery July 6, 1936.

Hulls No. 155-156. Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485'6"x68'0"x37'0"; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; launching Sept. 19, 1936; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

UNITED DRYDOCKS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION:

DD364, Destroyer Mahan, keel laid June 12, 1934; launched October 15, 1935; estimated completion, April 15, 1936.

DD365, Destroyer Cummings, L.B.P. 334'; beam 35'; mean draft 10'10"; keel laid June 26, 1934; launched Dec. 11, 1935; delivery indefinite.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; estimated delivery, June 9, 1936.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; estimated delivery, August 9, 1936.

UNITED STATES NAVY YARD

Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case, L.B.P. 334'; beam 35';** keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, July 1936.

Destroyer DD371, Conyngham, L.B.P. 334'; beam 35'; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, Oct. 1936.

DD389 Mugford and DD390 Ralph Talbot, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May, 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION: **U.S.S. Charleston, gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; estimated** launching Feb. 25, 1936; estimated completion date, June 1, 1936.

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; estimated launching Aug. 1936; estimated completion, Jan. 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD

New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B. P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, April, 1936; estimated delivery, Dec., 1936.

CL 48, **Honolulu,** light cruiser; L.B. P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January 1937; estimated delivery October 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers.

PG. 50, **Erie,** gunboat; L.B.P., 308'; beam, 41"; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; estimated launching, January 29, 1936; estimated delivery, May 1, 1936.

CG 69 and CG 70, **Alexander Hamilton** and **John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308'; beam 41'; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia,** L.B.P. 600'0"; beam 61',7¾"; molded depth at side to main deck amidships 42'0¾"; draft corresponding to normal displacement 21',8½"; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

DD372, **Cassin.** L.B.P., 334',0"; beam, 35',0-1/8"; depth molded at side to main deck amidships 19',7-7/8"; draft corresponding to normal displacement, 10',10"; standard displacement, 1500 tons; keel laid, October 1, 1934; estimated completion date, March 15, 1936.

DD373, **Shaw,** L.B.P. 334',0"; beam, 35',0-1/8"; depth molded at side to main deck amidships, 19'7-7/8"; draft corresponding to normal displacement, 10',10"; standard displacement, 1500 tons; keel laid October 1, 1934; estimated completion, June 15, 1936.

Coast Guard Cutter No. 65, George W. Campbell; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, July, 1936.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61' 9¾", depth molded at side to main deck amidships 42'0 3/8", draft corresponding to normal displacement 21'10"; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION: **SS 172, Porpoise; keel laid, October 27, 1933;** launched June 20, 1935; estimated delivery, Feb. 1936; **SS 173, Pike,** keel laid, Dec. 20, 1933; launched Sept. 12, 1935; estimated delivery, May, 1936. **SS 179 Plunger,** keel laid July 17, 1935, estimated delivery Feb., 1937; **SS 180 Pollack,** estimated delivery, May, 1937; L.B.P. 289'0"; beam 24' 11-1/16"; loaded draft 13-9"; diesel electric engines.

Two 1400-ton submarines, **SS185 Snapper and SS186 Sturgeon,** order received from Navy Department; September, 1935.

UNITED STATES NAVY YARD

Portsmouth, Va.

NEW CONSTRUCTION: Torpedo Boat Destroyer **Tucker (DD374)** for U.S. Navy, 341 ft. long; beam 35'; loaded draft, 10'10"; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, February, 1936.

Torpedo Boat Destroyer **Downes (DD375)** for U.S. Navy, 344 ft. long; beam 35'; loaded draft, 10'10"; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, May, 1936. Laying down lines under way in mold loft.

Torpedo Boat Destroyer **Bagley (DD386)** for U.S. Navy; keel laid Aug. 31, 1935; estimated completion November 1, 1936.

Torpedo Boat Destroyer **Blue (DD-387)** for U.S. Navy; keel laid, Sept. 25, 1935; estimated completion, Feb. 1, 1937.

Torpedo Boat Destroyer **Helm (DD-388)**; keel laid Sept. 25, 1935; estimated completion, May 1, 1937.

Order placed for **DD405** and **DD406,** two 1500 ton destroyers; no dates set.

American Merchant Marine

(Continued from Page 63)

manufacturers had been geared up to the highest possible production. Germany, temporarily at least, was out of the export trade. Great Britain needed rehabilitation.

The Merchant Marine Act of 1920 provided the means for the use of these war-built ships on foreign trade routes necessary to build up American overseas commerce.

The 1920 Act reiterated that the purpose was to build up an American merchant marine adequate and suitable to carry the greater portion of our foreign commerce, ultimately to be owned and operated privately by United States citizens.

This Act also provided for construction loan fund of $125,000,000 for new building, under which only fifteen ships were built with loans totalling $18,629,500. The Act also set up short term, one year, mail contracts.

But private capital could not be expected to immediately take over such gigantic undertaking. Further, one-year, five-year, and even ten-year mail contracts, or national aid measures, cannot and will not provide private capital for a hazardous business venture such as shipping in foreign trade.

Shipping is a long-term venture. The life of a ship is generally accepted as twenty years. Depending upon type and size of the ship, the unit cost for an ocean-going vessel will run from one to several million dollars. A simple freight ship will cost, today, around $108 to $130 per deadweight ton, and a passenger ship may run up to $350 and more per deadweight ton; hence, a twenty-year program is needed. For these reasons, the one-year mail contract proposal offered as an inducement to private owners to purchase the Shipping Board ships failed of its objective.

The next best program of government ownership with private operation on an agency fee basis was adopted, and essential trade routes were established. Experience gained by private operators and the foreign service training secured by their employees were valuable assets when the time came for private enterprises to take over the ships for their own account.

1926 — Realizing that our commerce requires special type of ship for each of its many essential trade routes; that our tremendous fleet of freighters was practically outmoded from the start; that something more than a one-year contract was required to induce capital to invest in American ships; that economic laws militate against high cost national aspirations without offsetting emoluments, the Senate requested the Shipping Board to prepare and submit comprehensive, concrete plans for the building up and maintenance of an adequate and suitable merchant marine.

The Board sent out 9000 questionnaires and held hearings in 33 cities throughout the United States. Those reached were unanimously in favor of an adequate merchant marine, and almost unanimous in the desire for private ownership and operation.

The Chamber of Commerce of the United States had appointed a committee to study the needs of an American merchant marine. This committee, in 1915, prepared and sent out a referendum ballot to 280 commercial organizations in thirty-nine states, the District of Columbia, Hawaii, Alaska, Philippines, Porto Rico and Paris, France. The questions and answers were:

"Do you favor the government undertaking the purchase, construction, or charter of vessels for mercantile purposes, together with operation of such vessels?"

89 Yes. 690 No.

"Do you favor ownership of merchant vessels by the government but with operation by private parties under leases?"

51 Yes. 713 No.

"Do you favor subsidies from the government sufficient to offset the difference in cost between operation of vessels under the American flag and operation in the same deep sea trades under foreign flags?"

554 Yes. 189 No.

"Do you favor subventions from the government to establish regular mail and freight lines under the American flag to countries in which the commercial interests of the United States are important, and to American dependencies?"

713 Yes. 52 No.

These two actions, eleven years apart, undoubtedly interpret correctly the opinion of the general business public of the United States.

(To be Continued)

Trade Literature

Doctors of Packing. This absorbing story of the history and development of packings has just been published in booklet form by Johns-Manville, one of the leading manufacturers in this field.

During our grandfathers' time packing was not so important. Machines operated at low pressures and speeds and demands made upon "stuffing" materials were so slight that cotton wicking or hemp rope served the purpose well enough. The entry of high pressures and increased speeds has made packings highly important.

Scientists have played a large part in improving packing to its present efficiency. Interesting illustrations show technicians in the Johns-Manville research laboratories testing the pressure, friction, temperature, leakage, wear, resiliency and other characteristics of packings designed to meet modern needs. Copies of this booklet may be obtained from Pacific Marine Review.

Engineers in charge of plants where heavy liquids such as fuel oil, lubricating oil, crude oil, or various chemicals, are to be conveyed from storage tanks to point of use, will be interested in a new bulletin on the G-R Storage Tank Oil Heater which has just been published by The Griscom-Russell Company. The bulletin fully describes the construction and special advantages of this unit, in which the heating elements have the unique G-Fin design which provides more than six times as much exterior heat transfer surface as the same length of bare tubes and thereby results in a compact, quickly responsive unit for heating viscous liquids. Alternate arrangements of installing the unit in storage tanks are explained and illustrated, and the bulletin also includes complete list of applications and specifications.

Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

● Embarcadero Character

"Chips" (Anton) Anderson has retired. Chips has driven the launch Barnacle for the Matson line since January, 1920. Being now 62 years old, Anderson is to enjoy a well-deserved pension, after years of marvelously skillful navigating of San Francisco Bay in densest fogs, or heaviest weather. He could find the Maui, Malolo, or Matsonia by their whistles when the fog was so thick no one else could see a boat's length ahead. "Ay can find her," he would say, and prove it. He acquired the nickname "Chips" as ship's carpenter in the windjammer days on the old Matson sailing ships, later on the Wilhelmina and other steamers, long before he took over the launch, Barnacle. Dour of countenance and taciturn in demeanor, Chips was well known by anyone who had much to do about the Embarcadero—Matson Line old-timers, immigration and horticultural inspectors, ticket agents, and hundreds of others who meet incoming ships for one reason or another. Anderson will retire to a small grape ranch which he owns in Mendocino County. He has been succeeded in the Matson employ by **R. F. Sollie,** who will skipper the new launch Wikiwiki, the Barnacle having been retired at the same time as her commander. Sollie was formerly quartermaster on the Mariposa.

● Grace Banquet

Fred L. Doelker and **Edward T. Ford,** respectively Pacific Coast manager and president of the Grace Line, were hosts in person and by proxy at this year's annual dinner-dansant and entertainment held aboard the liner Santa Rosa at pier 35. Mr. Doelker, who acted as master of ceremonies, read a message from President Ford in New York, expressing his regrets at being unable to be present in person. Committee in charge of the event which featured in addition to dinner and dancing, entertainment by artists from several San Francisco night clubs and radio stations, were **George Mahoney** and **William McPherson.**

A. F. Zipf, district manager of American-Hawaiian Steamship Company, announced recently that his company has placed on berth as an extra sailing, the freighter Golden Harvest, which sailed January 23 for New York, Philadelphia and Boston.

Captain L. M. Edelman was chairman and **Lieutenant Commander R. M. Ihrig, U.S.N.** guest speaker at a dinner for all nautical school-ship men staged at the Army and Navy Club, Fairmont Hotel.

●

A group of Matson Navigation Co. officials and guests flew over the Bay area Tuesday from Alameda airport in the new Sikorsky amphibian which is here for shipment to Inter-Island Airways in Hawaii, the westernmost domestic U.S. mail route. In our photograph are (left to right): Edward Moffatt, manager Market-Ferry branch, American Trust Co.; Alex Young, president of Shreve, Treat & Eacret; W. H. Sellander, passenger traffic manager, Matson Navigation Co.; George Montgomery, vice-president Castle & Cooke, Ltd.; J. E. Ryan, general passenger manager of Matson Navigation Co.; J. C. McClintock of the Matson passenger department; Al Young of Fireman's Fund Insurance Co.

●

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San Francisco.

●

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L. M. Edelman
John Greany
C. M. LeCount
W. Edgar Martin
Fletcher Monson
George E. Swett.

OFFICIAL NEWS

The administration of Joseph J. Geary was launched with significant enthusiasm with the appearance before our January 21 luncheon meeting of Charles L. Wheeler, executive vice-president of McCormick Steamship Company.

Guest Speaker Wheeler presented a vital talk, choosing as his topic "The West Coast Shipping Picture" . . . a clear, concise, and "straight from the shoulder" analysis of ship operating conditions on our seaboard.

Mr. Wheeler's reputation as an authoritative speaker brought out a fine audience. His addresses to the Propeller Club of California have been annual highlights for the past three years and his listeners are always well rewarded.

President Geary was chairman of the day, christening the 1936 craft like a past-master. Program chairman Dick Glissman presented some sparkling entertainment which was well received—and complimented by our guest speaker in the preface of his talk.

As this resume of club activities is being compiled, announcement comes from the committee heralding the next meeting of the club — our February 4 date:

Kenneth A. Kennedy, executive of the San Francisco division of Pan-Pacific Airways will be the speaker.

With giant clippers racing across the Pacific skies, establishing this new means of transportation, interest in Mr. Kennedy's talk is most timely. We learn that a sound motion-picture short will be projected in conjunction with the speaker's address.

Gentlemen of the Propeller Club meet your new Chairman of the Board of Governors!

Mr. Edward H. Harms was the unanimous choice for this important post.

Chairman Ed Harms, Assistant Operating Manager of McCormick Steamship Company, has been a loyal worker for the advancement of the club since its early years. He has served on the Board of Governors and on committees always lending an enthusiastic force to the job on hand.

Important new committees have been named by the new administration with the following personnel:

Entertainment and Luncheon

Dick Glissman, Chairman
Frank Fox
Bern De Rochie
Cyril Meek
Les Moody
Joe Moore, Jr.
James Vizzard.

Golf Committee

Vernon Showell, Chairman
Grover Coats
John Greany
Roger Lapham
Graham Smith
John Thies
Frank De Benedetti
Carroll Reeves

Auditing Committee

C. M. LeCount, Chairman
John Parker
Theo. Levy

Sea Scout & Schoolship Committee

L. M. Edelman, Chairman
Thos. Mahar
Henry Barbieri
Wm. J. Darragh.

Publicity

Paul Faulkner, Chairman
George Stoddard
Howard Oxsen

Legislative

C. E. Finney, Chairman
P. H. Harding
Edward Senter
Carl Nordling
A. L. Becker.

Membership

A. S. Gunn, Chairman
T. A. Yeager
Henry Blackstone
J. F. McConkey
V. W. Hoxie
Jos. B. McKeon

● Robert L. Hague Heads Lifeboat Racing Group

At the annual meeting of the International Lifeboat Racing Ass'n, Inc., held January 13 at the Downtown Athletic Club, Robert L. Hague, of the Standard Oil Company of New Jersey, was elected president to succeed John D. Reilly, head of the Todd Shipyards Corporation, who has been president of the Lifeboat Association for the past two years. Mr. Reilly was elected a director. Other appointments were:

1st Vice-President — Joseph J. Kelleher.
2nd Vice-President—Fred B. Dalzell.
3rd Vice-President—John F. Milliken.
Secretary—M. D. Stauffer.
Treasurer—Robert F. Hand.

Directors to serve for three years:

John D. Reilly.
Hon. Edw. P. Mulrooney.
John M. Franklin.
Ira A. Campbell.

William Groundwater, Director of Transportation, Union Oil Company of California, who has just been appointed chairman of the shipping section of the Los Angeles Chamber of Commerce Harbor, Foreign Commerce and Shipping Committee.

ANNUAL DINNER SPERRY 15-YEAR CLUB

The second annual dinner of the Sperry Employees 15-Year Service Club was held at Trommer's Hall in Brooklyn. The dinner was a testimonial in honor of twenty-one men who on January 1st had rounded out twenty years with the Sperry Gyroscope Company, Inc.

The membership of the 15-Year Club numbers 173 and includes all employees of the Company, both men and women, regardless of rank or position, who have had at least fifteen years of service.

Mr. Carl F. Carlson, Foreman, Electrical Winding Department, president of the Club, introduced the speakers, who included Mr. Thomas A. Morgan, Chairman of the Board of Directors; Mr. Preston R. Bassett, Vice-President in Charge of Engineering; and Mr. Reginald E. Gillmor, President and General Manager. Mr. Gillmor, on behalf of the management, presented each of the honor guests with either a gold watch or silver service, and, being an honor guest himself, received his watch from the hands of Mr. Morgan. Mr. James E. Larg, Foreman, Aeronautical Instruments Assembly Department, responded for the honor group composed of: C. D. Butt, James F. Cantwell, George Eckert, Jacob Friedman, C. A. Gilfeather, R. E. Gillmor, Paul Grouleff, George M. Hayman, Frank R. House, Frank Kellinger, Louis Kelm, James E. Larg, Robert B. Lea, August Masek, G. L. Moulder, Shierfield G. Myers, J. J. Nelson, Alexander Schein, W. J. Schraner, Eric C. Sparling, Elmer A. Sperry, Jr. There is now a total of forty-eight employees having twenty or more years of service with the Sperry Company.

The final business of the evening was a short meeting of the club for nomination and election of officers for the ensuing year.

● Grace Line Appoints Junior Executives

W. B. Wheeler, Passenger Traffic Manager of the Grace Line, announces the appointment of R. A. Shiner, Cameron Rogers and Godfrey Macdonald as Assistant Passenger Traffic Managers with headquarters at 10 Hanover Square, New York City.

Mr. Shiner's work will deal with the Grace Line's South American Service; Mr. Rogers will conduct publicity in addition to his transportation duties; and Mr. Macdonald will have charge of the Grace Line's uptown office at 628 Fifth Avenue.

Announcement was made this month by **J. S. Mahool,** general passenger traffic manager of the International Mercantile Marine Company, that by an agreement with Pan American Airways, the I.M.M. will become sole general passenger agent in North America for this airways system. At the present time this airways system covers some 33,000 miles; in May an additional 8706 miles will be added with the inauguration of passenger service to Macao, China, where the route now operates only a mail service. The International Mercantile Marine Company are owners of the United States Lines, the Panama Pacific Line and other trans-Atlantic lines. The present agreement will give exclusive general passenger representation to the I.M.M. in Boston, Baltimore, Cleveland, Detroit, Memphis, Norfolk, Philadelphia, Montreal, Toronto and Halifax and their immediate territories. In New York, Chicago, San Francisco, Seattle, and Los Angeles, where the Pan American Airways system maintains special offices, bookings may be made through these offices or those of the I.M.M.

● Pacific Coast Visitors

To the West Coast during January came Joseph J. Nelis, vice-president of Foster-Wheeler Corporation, and G. H. Froebel, marine sales manager of the Westinghouse Electric and Manufacturing Co. of South Philadelphia works.

Mr. Froebel, here to confer with Westinghouse executives, reports full speed ahead in Eastern yards where the tanker and naval construction program is keeping things humming.

Mr. Nelis spent three weeks in our territory making a plane trip from Seattle southward. In an interview with this reporter January 31, Mr. Nelis states: "There is no question in my mind that Pacific Coast yards will soon get going on the long-awaited shipbuilding activity. Many of our Eastern yards are now taxed to capacity with contracts in hand. There are many new tankers to be built this year, several freighters—and I look for the launching of the auxiliary vessel program which has recently received such favorable support." Mr. Nelis expects Coast yards to come into their own during the second half of the year. The F-W vice-president expressed his satisfaction with interviews he conducted with Coast operating executives.

Harvey M. Huff, former general freight and passenger agent of the United Fruit Company, resigned recently. **Frank Cook**, general freight agent, has assumed charge of the freight department; and **William B. Fitch**, passenger agent, of the passenger department.

D. M. Dysart, manager of the intercoastal department of the General Steamship Corporation, has returned from a business trip to Boston and New York.

M. A. Cummings has succeeded the late F. W. Gomph as agent of the Pacific Freight Traffic Bureau. The appointment was effective on January 13.

John E. Cushing, vice president in charge of traffic for the American-Hawaiian Steamship Company, has been re-elected a director of the San Francisco Chamber of Commerce for the year 1936.

Thomas G. Widmeyre, former general agent of the Nelson Steamship Company, has been promoted to district manager of the Los Angeles district.

Ernest Sonnefleth, first chief steward aboard the Grace liner, Santa Rosa, is on his forty-eighth consecutive voyage aboard that vessel, where he has served since her launching. Sonnefleth is the oldest chief steward in point of service on this coast for Grace. He joined the old Panama Mail Line as head steward on the cabin liner Venezuela, which now operates out of New York.

Rowland C. Clapp, president of the Rothschild Stevedoring Company of Puget Sound; and **Charles Tait**, vice president of the International Stevedoring Company of the Columbia and Willamette rivers, Coos Bay and Puget Sound, have announced the merging of their companies and the W. J. Jones Company of Oregon. Reason for the pooling of interests was announced as the enabling of the company to handle 120 ships a month on Puget Sound and the southern range. **W. J. Jones**, president of the W. J. Jones Company, will head operations on the Columbia and Willamette rivers and Coos Bay. Clapp will be in charge on Puget Sound, and Tait will continue as International head.

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PACIFIC MARINE REVIEW

MARCH
1936

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SEE LEADING EDITORIAL
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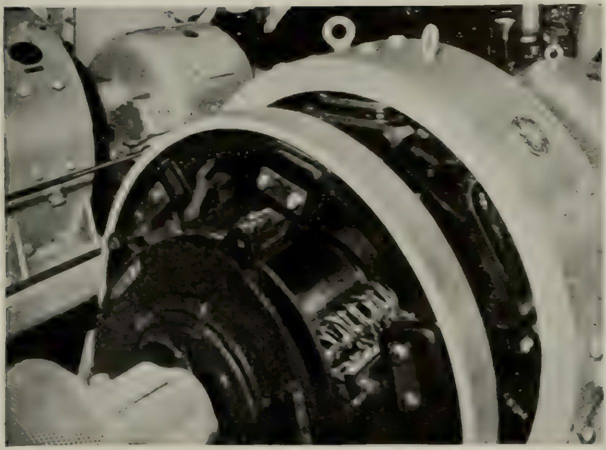

"Lights are bright, Sir"

FOUR bells rings on the bridge and from the watch on the foredeck comes back the answer, "Lights are bright, Sir." Down below, on the generator flat, an oiler making his round notes on the log: "voltage, 240; bearings, cool." A passenger switches on his reading lamp; the telephone operator plugs through a call; a water-tender adjusts the rheostat on a fuel-oil pump. Four bells, and all is well.

The G-E auxiliary generator hums smoothly, hardly heard above the whir or throb of the main engines. Is its air gap right; was its regulation calculated correctly; how is the insulation standing up? Hour by hour, night by night, year by year, that call from the deck answers, "Lights are bright."

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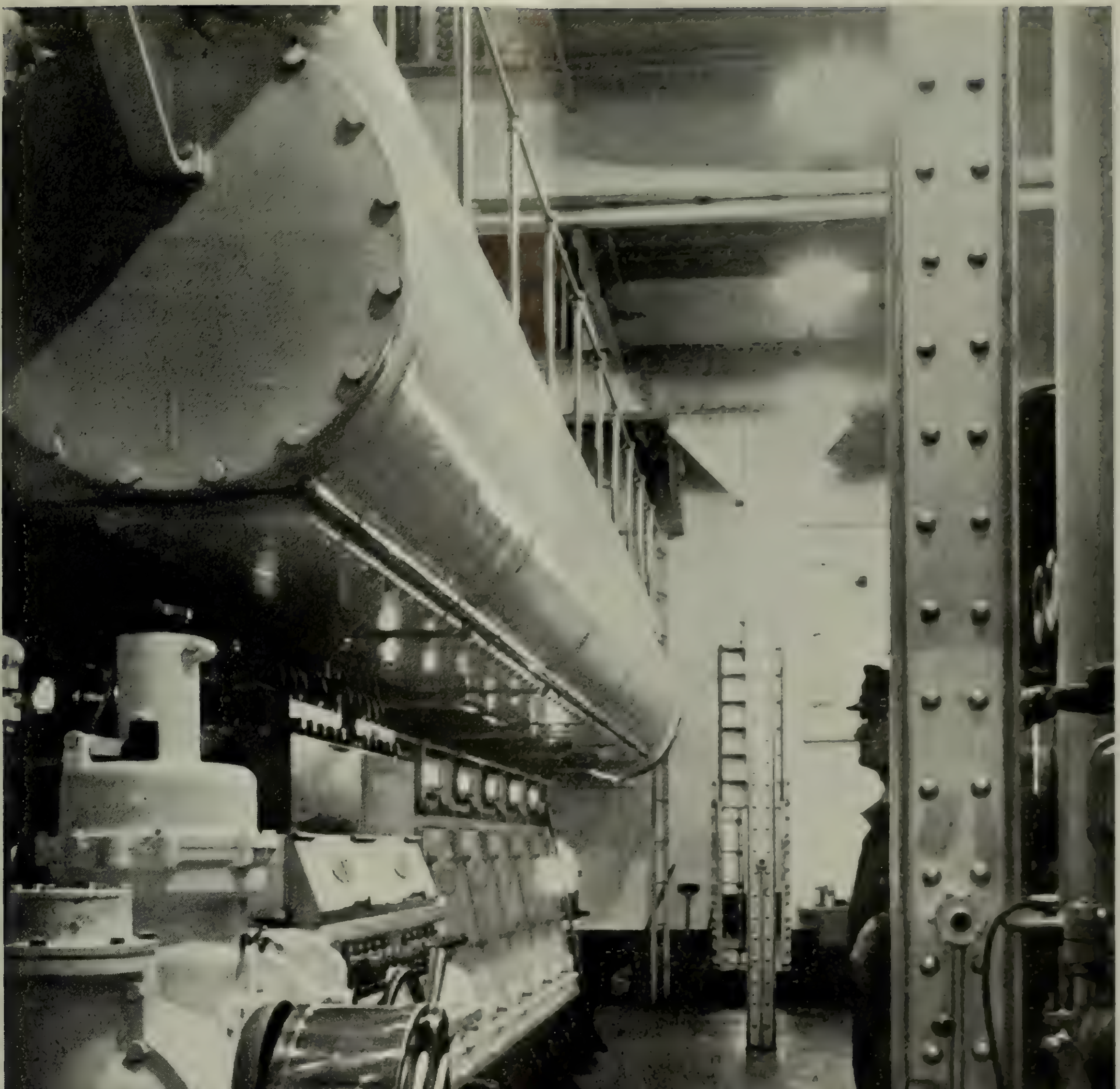

The Busch-Sulzer Diesel Engine room of the Motor Ferry, Kalakala. The advantage of visibility in observation of piston performance is clearly shown. Chief Albert Thornton is pictured. This magnificent art-photographic study in lights and shadows is the work of A. A. Tacchella, Pacific Coast sales-engineer for the Diesel firm.

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PACIFIC MARINE REVIEW

VOLUME XXXIII MARCH, 1936 NUMBER 3

Editorial Comment »« »«

Pacific Coast Naval Shipbuilding

The Naval Affairs Committee of the House of Representatives is now considering the Auxiliary Naval Construction Bill. This bill authorizes the expenditure of $175,000,000.00 for building 54 ships, totaling 221,000 gross tons, of which at least 50 per cent, by the terms of the bill, must be built in commercial shipyards. In the drafting of this bill, there was included through the good work of California congressmen and senators, a 6 per cent differential for building in Pacific coast yards.

Without this differential, the bill would have passed immediately as a routine measure. However, serious opposition to the differential has developed on the part of high ranking naval officials. From the arguments used it is apparent that these naval officials do not want naval ships to be built on the Pacific coast. As quoted in the Associated Press, Admiral Land declares, "The Navy Department believes the navy belongs to the country, not to any one section of the country. The navy is opposed to this differential because there has been little or no building on the west coast since the war. In competitive bidding, the east coast has been able to obtain new merchant marine and other construction by bidding lower."

If this statement is correctly quoted, and if it reflects correctly the opinion of the U. S. Navy on this matter, it must be clear that the opinion of the Admiral and his confreres is decidedly against the building of any ships in Pacific coast yards and that this opinion is so set that they are willing to warp the truth to its support.

They know that on several post war contracts for both naval and merchant vessels the bids of Pacific coast yards have been lower than those from Atlantic coast yards, and, that fact notwithstanding, the contracts have been given to the Atlantic coast yards on legal technicalities interposed against Pacific coast bids.

They know that there are several Pacific coast yards well able to build and equip the type of auxiliary naval vessels contemplated in this bill. They should know that this differential will result in lower bidding for all the ships on the assumption that any Atlantic coast estimator, knowing he is up against a 6 per cent differential, will keep his pencil and his wits in sharper condition.

The causes of their objections, then, simmer down to an adverse opinion on Pacific coast shipbuilding, in general.

Now, insofar as the navy itself is concerned, history shows that ship for ship, the naval vessels built in Pacific coast yards have had records as good as, or better than, their sisters built on the Atlantic coast.

Of intense interest to many ship-minded Pacific Coast voters would be the knowledge of just what is behind this opposition to Pacific coast shipbuilding. Let us keep hounding our congressmen and senators until we discover the real reason.

The United States navy does, indeed, belong to the entire country, and for that very reason its building should not be confined to one-tenth of the coastline of the country. The Pacific coast is an integral and very important part of this country, and if we include in that term the coasts of Alaska and Hawaii, then the Pacific coast is the chief defense problem of the U. S. navy and it will always be highly important to the U. S. navy in time of emergency to have available, well equipped commercial shipyards at strategic ports on this coast.

As we go to press comes the encouraging news that shipyard labor troubles are measurably near to settlement. On February 26 the shipyards and ship repair shops of the San Francisco Bay area signed a one year agreement covering wages and conditions with eight labor organizations, representing all except one of the shipyard crafts involved in the present strike. The exception is the machinists. There is much promise that this union also will come under cover and that the shipyards will again be busy on repair work and new construction.

Before 1936 is over the United States should again be well up toward the top among the world's shipbuilding nations.

Super-Liners

We now have a super-proposal for super-liners. A former head of the United States Lines wants the Government to build two "super-cabin liners" that would beat anything afloat, or anything now under construction, in size, capacity and speed.

Each of these huge twins would have a displacement of 100,000 tons, and would be a quarter of a mile long, 144 feet wide, and accommodate 10,000 passengers in first-class style. They would only cost $100,000,000.

None of the super-liners already built by various nations in this race for size and grandeur are making a profit. Most of them are operated at an enormous loss. The French Normandie loses $6,000,000 a year. The United States itself lost so much money on its big ships that it felt obliged to lay them up. There seems to be nothing in this game except prestige. And what good is prestige when expressed in red ink?

Sensible travelers prefer smaller ships, and the trend of the ocean passenger business is in that direction.On a reasonably sized vessel the traveler knows he's on a ship at sea, and has all the appropriate sensations and experiences. On a craft like those proposed, except for the satisfaction of bragging about it afterward, he might just about as well be quartered on a floating dock or living on the tenth floor of a seaside hotel.

—Editorial from Berkeley Gazette.

Panama Canal Measurement Rules

Shipowners have for years been protesting that Panama Canal tolls were too high, and that a more equitable rate should be established, based on the amortization of that portion of the total cost of the Canal Zone which can reasonably be charged to its use as a waterway for ships of commerce. On this same basis, American shipowners are opposed to the passage of S. 2288 —"A bill to provide for the measurement of vessels using the Panama Canal and for other purposes."

This measurement would base all merchant vessel tolls solely on net registered tonnage as measured by the Panama Canal rules with the proviso that all deck loads are exempt where located on a deck exposed to the weather and the sea. It provides that "Tolls on vessels of commerce when laden, other than tankers, shall not exceed one dollar per net registered ton, determined under Panama Canal rules, nor shall tolls on any vessel of commerce, when laden, be less than 60 cents per net registered ton as determined under the aforesaid rules: provided that tolls on tankers shall be 10 cents per net registered ton higher than tolls on other laden vessels of commerce.

"The rate of tolls may be lower upon vessels in ballast than upon vessels carrying passengers or cargo."

Toll for each passenger shall not be more than $1.50. Act to take effect, January 1, 1937.

The Panama Canal Act of 1912 authorizes the President of the United States "to prescribe, and from time to time, to change tolls that shall be levied." Change was subject to six months notice. "Tolls may be based upon gross or net registered tonnage, displacement tonnage or otherwise." On whatever basis measured, tolls were limited to maximum and minimum amounts equivalent to $1.25 and $0.75 per net registered ton.

On November 13, 1912, President Taft proclaimed a toll rate of $1.20 per net ton for laden vessels, with a 40 per cent reduction for vessels in ballast; and directed that rules be established for measurement.

On October 2, 1913, Emory R. Johnson submitted an elaborate report on "Measurement of Vessels for the Panama Canal", and on November 21, President Wilson proclaimed rules based on this report. In 1914, shortly after the canal opened to commercial traffic, the lumber interests claimed that vessels with deck loads as measured by Panama Canal Rules were paying more than $1.25 per net registered ton. On this question being submitted to the Attorney General, he decided that the term "net registered ton" in the Panama Canal Act of 1912 clearly meant "net registered ton", United States measurement.

Consequently, although ships of commerce transiting the canal are measured by Panama rules and have Panama measurement certificates, if the United States net measurement tonnage multiplied by $1.25 is less than the Panama measurement tonnage multiplied by $1.20, the United States measurement figures control.

United States measurement rules are based on International rules, and are the controlling figure for practically all other tonnage assessments against vessels. They are in a process of continual evolution to meet new conditions, new ship forms, new methods of construction. So the Panama Canal toll gatherers find that ships which they think should pay $1.20 per ton Panama measurement, can show such low United States measurement as will, when multiplied by $1.25, be equivalent to only $0.70 a ton, Panama measurement.

Notwithstanding this low figure for many ships, the shipowners claim that they are in the aggregate paying a far higher toll to the Panama Canal than is warranted under any fair amortization plan for the cost of the canal as a commercial waterway. This claim is amply justified by facts.

Bill S. 2288 would establish rates that will force shipowners to pay a higher aggregate toll than they do now. The bill, itself, and the report thereon by its sponsor, Senator Gore, indicate an insistence on revenue production rather than an inclination to operate the canal for the benefit of shipping. Under the exclusive Panama Canal rule measurement, all passenger vessels would pay tolls on public room spaces and on large blocks of bedrooms which are exempt under United States Registry rules. In the report on the bill it is assumed that "The Panama Canal rules will no doubt be revised in the light of changed circumstances to relieve vessels of the passenger type from these charges." Experience of shipowners is that such revision is very difficult to obtain.

The clause making a 10 per cent raise in the toll rate for tankers is hard to understand. This class of vessel measures very high under United States rules in comparison with standard cargo carriers. It has no opportunity to make tonnage openings. Therefore, for years, the tanker tonnage transiting the canal has paid more than its share of tolls. It is, therefore, possible in the minds of Senator Gore and of the Committee, to maintain the tanker toll at a higher rate than that charged for cargo tonnage and still reduce slightly the total charge against the tanker.

Thus, the new bill, if passed, will maintain the status quo. The common carriers paying slightly more than at present, the tankers slightly less but more than their share, and the total toll collected from commercial ships considerably higher than it should be on the assumption that commercial shipping should pay running expense and interest on investment.

Twenty-Five Years Ago

Pacific Marine Review for March, 1911, published in Seattle, and the "First Established and Only Exclusively Marine Paper published on the Pacific Coast" had several articles indicating that then, as now, it was vitally interested in new developments affecting shipping. For instance we read:

"For the last eighteen months there has been running on Lake Zurich, Switzerland, a diesel engined passenger boat which was formerly a steamer. Built as a steamer, she made 7½ knots on a coal consumption of about 30 pounds per mile—costing 5½ cents a mile. A 200 horsepower, four cylinder, two stroke cycle, single acting diesel was installed in place of the steam engine and boilers, and she now makes 10.5 knots on less than 6 pounds of oil per mile, or at a cost per mile of approximately 3 cents. The supply of liquid fuel carried is enough to drive her 10 times the distance that the coal bunkers formerly served, and, of course, much time is saved at terminals through the easy loading of oil."

A delegation of shipbuilding executives from the principal Atlantic coast shipyards were protesting to the Secretary of the Navy against their companies having been singled out for the compulsory application of the 8-hour law as regarded naval construction.

The floating electric welding equipment of the Standard Boiler Works, Seattle, had been in constant demand. Among recent marine welding jobs were boilers of the lighthouse tender, Armeria, condenser of S.S. Northland, and rudder frame of S.S. Watson.

Then, as now, there was beginning strong demand for new tanker tonnage. Newport News Shipbuilding and Drydock Company on February 4, 1911, had launched the steam tanker, William F. Herrin, for the Associated Oil Company.

Samuel Holmes, ship broker of New York, was busy on propaganda for the merchant marine with his slogan "Tax the Tariff". He proposed to levy "an excise on all American manufacturers where there is a protective duty on the foreign competitive article. This excise to be sufficient to raise a sum large enough to overcome the higher cost and higher operating expenses which have been imposed on the American ship by the protective tariff". He calculated that a tax rate of one-tenth of one percent would furnish ample funds. He proposed thusly to:

"Merge the American ship with the protective tariff;

"Merge the overseas trade with the manufacturing interests;

"Merge the sea and the land, the ship and the factory."

Effective March 6, with the sailing of the Harvard, the Pacific Navigation Company, operating the turbine steamers, Yale and Harvard, announced the extension of its service to San Diego on the weekly Wednesday and Friday sailings from San Francisco.

President Taft's recent message to Congress "contained a recommendation that railway owned or controlled steamship lines should be prohibited from navigating the Panama Canal."

Coordinate Radio Beacon Service

Shipping on the Pacific and Atlantic Coasts of North America will benefit greatly from the coordination of Canadian and American radio beacon services which became effective at midnight, November 30, 1935. The general principles adopted by the conference of May 14 to 18, 1935, cover frequency assignments, time cycle of operation, identification characteristics, synchronization for distance finding, power rating and range, transmission schedules for fog and clear weather, group operation of stations, desirable characteristics of transmitters and direction finders, geographical distribution of long-range stations to effect full coverage of coasts, and consultations prior to additions to or change in the system of radiobeacons where desirable.

So far as the navigator is concerned, the principal benefits will be greater frequency of operation, less interference between beacons, only system on all coasts of both countries, and much greater public interest in the establishment of additional stations.

Along with this important step in advance, the U.S. Lighthouse Bureau announced the immediate installation of ten more radio beacons at lighthouses and on lightships. Seven of these are lightship installations, and when they are completed every U.S. lightship will be equipped with a radio beacon.

. . . . *Scuttling*
America's Merchant Marine

The Pettengill Bill Must be Killed Unless We Wish Surely to Destroy American-Flag Shipping

We are quite sure that any American congressman who was given the opportunity to pull a string or push a button that would sink every American-flag merchant ship would recoil with horror from such an act and would immediately start an investigation to prevent any other person from pulling that string or pushing that button. We are convinced that practically every congressman and senator is at heart a friend of the American merchant marine, and would like to see the American flag flying over more and better ships. And yet, notwithstanding this love for the American merchant marine, no session of congress passes without many bills being introduced which, if passed, would spell inevitable ruin to American shipping. Sometimes such a bill is merely the result of local politics and dies a natural death in committee manipulation. Sometimes it is the result of the influence of foreign lobbying and is killed on the floor. Sometimes it is backed by powerful vested interests in competitive forms of transportation and is, therefore, constantly showing up in varied form from one congress to another requiring constant vigilance to keep it from becoming law.

To this latter class belongs H.R. 3263, which was left at the switch during the hectic rush that closed the congressional session of last fall, and is now up again for consideration at Washington.

H.R. 3263, the so-called Pettengill bill, is a very simple document, which—if enacted—would repeal the long and short haul clause of Section 4 of the Interstate Commerce Act. This measure would, in a single stroke, nullify the effects of an evolutionary process of legislation through which Congress, by successive enactments, has sought to curb unreasonable competitive practices through which railroads are trying to eliminate all rival transportation by water.

It is an old story in American transportation, this fight between economical water transport and unrestrained rail competition. Prior to 1887, the highly subsidized railroads proceeded on the principle that all transportation should be by rail. Even where great losses were inevitable, the railroads would quote ruinous rates to stifle actual or to forestall threatened water competition.

● *Interstate Commerce Act*

When the Interstate Commerce Act became law in 1887, "reasonably compensatory rates" were theoretically imposed; but practically the language "a reasonably compensatory" rate was frequently interpreted to mean one covering "out of pocket costs."

This condition continued until 1910, when the Interstate Commerce Act was amended to deny the railroads the right to charge more for a short haul than for a long haul, except that in special cases the I.C.C. might grant the right temporarily. In 1912, the opening of the Panama canal being imminent, Congress passed the so-called Panama Canal act, prohibiting any railroad from owning or operating or having any interest in any ships transiting the Panama canal with which the railroad does or might compete.

The national position in this matter was again strengthened by the Transportation Act of 1920 in which Congress declared the national transportation policy "to promote, encourage, and develop water transportation, service, and facilities in connection with the commerce of the United States and to foster and preserve in full vigor both rail and water transportation!"

At the same session, Congress further amended the fourth section, Interstate Commerce Act, by providing that even should the Commission find in a special case that a higher charge might be made for a shorter haul than for a longer haul, nevertheless it should not be permitted unless the charge for the longer haul was reasonably compensatory for the service performed.

Since this requirement was added to the 4th Section in 1920, the railroads have repeatedly tried to convince the Commission that "reasonably compensatory" is equivalent to "out-of-pocket cost." Partially defeated in this, their last resort is to the shipping public and to Congress. Their plea, in effect, is for restoration of the freedom enjoyed by them prior to 1910, or failing in that, of the position they occupied prior to 1920, when the Interstate Commerce Commission could and did repeatedly grant authority to establish less than reasonable compensatory rates that had the effect of seriously retarding the growth or of entirely eliminating water competition.

The effect of the Pettengill bill would be to destroy intercoastal water competition entirely. This would be evidenced first by steamer service curtailment, then by cumulative restriction of liner services and industrial carriers. The following brief survey shows very graphically just what is involved.

If we omit all ships under 2000 gross tons we have a total of 1997 ships totalling 11,335,000 gross tons. These are split as follows.

Great Lakes	438 ships total	2,330,000 gr. tons
Tankers	348 ships total	2,406,000 gr. tons
Government		
Laid Up	228 ships total	1,360,000 gr. tons
Coastwise	497 ships total	2,175,000 gr. tons
Foreign Trade	488 ships total	3,084,000 gr. tons

This entire program is seriously jeopardized by the passage of the Pettengill Bill.

We have 4883 miles of coastline on which there are 50 seaports, 20 of these being of primary importance. The value of shipping terminals at these seaports has been set by competent authorities at over one billion dollars; while the Federal, State and Municipal authorities have spent over 600 million dollars on seacoast, harbor and channel improvements.

All of these ports and investments are jeopardized by this proposed legislation.

There are employed on American ships more than 165,000 American officers and seamen. Fully that many are directly engaged in shore activities of American shipping.

The American shipyards represent an investment of 100 million dollars and employ 26,500 men directly and fully that many indirectly.

Passage of the Pettengill Bill will force a heavy curtailment of this personnel, much of which is highly technical. Such a curtailment would be greatly detrimental to the nation at any time, and positively dangerous in times of national emergency.

In 1929 our coastwise, intercoastal and Philippine Island seaborne commerce amounted to 251,174,333 short tons and was valued at $12,561,033,821. If cheap water transportation is eliminated under the American flag due to unmerciful and unscrupulous railroad rate cutting on port to port business, is it reasonable to anticipate the volume set out above?

If intercoastal carriers are eliminated what effect will it have on the Panama Canal? Keep it we must. Our national safety depends upon this canal being operative during war times. Without the heavy volume of intercoastal ships the Canal would operate at a loss. If rates are too high, ships will use the Suez or go around the Horn. We have ample knowledge of this situation now.

Millions of dollars are spent yearly for wages, supplies, repairs and the like. Is this revenue and its concomitant labor to be sacrificed?

Bay and river craft will be seriously affected. They are now extensively utilized. With rail shipments only, the need for river and small bay craft will greatly disappear.

We may confidently also predict a burdensome rate for interior points. If the long haul rates are lowered, if the rail lines need more revenue, the non-competitive intermediate points must pay. History will repeat itself.

● *Effect of Bill on Railroads*

The railroads are in dire trouble, but what will they get in exchange for the destruction of all this maritime investment?

In the purely domestic carryings, excluding coastwise and intercoastal, the Interstate Commerce Commission estimated the railroads carried 73.9 per cent of the ton miles of the 1932 commerce.

During 1928-1929, the carloading reports showed about one million carloads, or about 30 millions of tons of cargo, per week, a total of 1,500 million tons per year. The tonnage moving via Panama-Intercoastal during the same period was approximately eight million tons, exclusive of bulk oils in tankers. Intercoastal cargo is, therefore, about one-half of one per cent.

A great part of this intercoastal cargo is bulk in nature—lumber, grain, sulphur, steel, and other commodities best handled by ships.

The total tonnage in a competitive class with railroads during 1928-1929 period totals about 5 million tons both east and west bound.

Due to the depression the 1932 competitive cargo amounted to a total of about 3 million tons.

To get this the railroads are willing, nay anxious, to sacrifice national safety by destroying water transportation which in the past has been almost the only source from which transports have been available.

The gross revenue of the railroads in so-called normal times is about 6 billion dollars. In 1932, about 3 billions. The gross revenue of the steamer lines intercoastally in 1932 was about 40 million dollars. So the additional revenue to the railroad would be only slightly more than 1 per cent with the ships entirely eliminated.

● *Who Gets Subsidies*

In the purely intercoastal or coastwise trade, no subsidy has been paid American ships. They pay the same Panama Canal dues that any foreign ship of like nature is charged.

Railroads have been subsidized by counties, states and the nation with presents of valuable sites and rights-of-way, and by enormous tracts of public land.

At the present time the United States Government is granting railroads hundreds of millions of dollars to pay interest charges, debts, taxes, improvements and wages. Four hundred and fifty millions to sixty railroads is the present figure, according to Mr. Ickes. As we go to press the statements of many American railroads published in current daily press show tremendous increases in earnings and in many cases show very fair profits.

The Pettengill bill must not pass unless we wish to scuttle the American Merchant Marine.

EDITORIAL CORRESPONDENCE

Diesel Exhaust Temperatures

The Editor
Pacific Marine Review
San Francisco, Calif.

Sir:

The article on "Importance of Exhaust Temperatures" in the January issue should interest every diesel engineer. The temperature of the exhaust gases is important; yet an engineer is mistaken if he either places blind faith in it or, on the other hand, neglects it altogether. A combination of indicator diagram and exhaust temperature readings is a better method of detecting cylinder and combustion defects.

It is easier to give the advice than it is to take the cards, but a systematic taking of regular, pull and light spring diagrams, the latter high enough to show the beginning of the exhaust period, at convenient times and especially before a shutdown or entering port, may save much unnecessary work and delay.

Taking cards, say on the "graveyard" watch or when at the peak load, for some defect which may be located otherwise by an engineer who knows his engine, not only is out of the question but is unnecessary. After all, a diesel engine under the care of experienced engineers does not suddenly develop alarming defects. Defects, yes; ninety-nine per cent of which are put right as a matter of watch routine.

Mr. Graves' conclusions that defects in fuel atomization and low compression pressure within the limits of the cylinder firing result in lower exhaust temperature is not borne out in my experience. At or near full power such defects mean, with some exceptions such as too early injection, that the fuel is so late finishing injection that it does not have a chance to burn completely during the combustion period and consequently continues to do so during the greater part of the expansion period; that is, after-burning takes place.

If the combustion is completed during or reasonably soon after the period allowed, the gases follow closely the law of polytropic expansion, losing heat owing to work being done on the piston and to the cooled surfaces of the cylinder, then the exhaust temperature will be normal. But if combustion is still taking place during the expansion period, such combustion adds to the pressure and temperature of the gases and results in a high exhaust temperature. Exhaust valve and piston trouble are sure when the exhaust temperature is abnormally high.

Some operators do not realize that the air injection type of valve remains open for a certain period after all the fuel has been injected into the cylinder, in order to make sure that an accumulation of oil above that of the measured supply from the pump does not collect in the valve chamber. If the atomizer is partially choked by dirt the spray into the cylinder is irregular and delayed, so that after-burning takes place.

Dirty fuel used with either the common rail or the automatic differential type of fuel injection is an impossible combination, in so far as expecting the engine to run any length of time is concerned. Any engineer who accepts dirty fuel or who allows his tanks to get so dirty that strainers will foul sufficiently to starve the engine will not get much information from the exhaust temperatures. The engine will have stopped.

Again, if a highly volatile fuel is to be used and the valve timing and atomizing plates are not adjusted, a dangerous rise in cylinder pressure, due to excessive constant volume combustion, may take place. The escape valves will warn the engineer before he has a chance to observe the exhaust temperatures.

Much thought should be given before a change is made in the cylinder compression ratio. In the past some engineers, with a limited knowledge of the laws of gases, were tempted to change the compression ratio in order to make starting easier in cold weather. It made for easier starting, but at the same time it was the cause of future trouble. If the connecting rod bushes have worn so much that the ratio has changed materially and the original thickness of the bushes is known, or if reference marks are stamped on the piston, crosshead or guide, the change can be made, providing the original moving parts are still in use. Even then the engine should be jacked over to determine that all is clear and at the first opportunity compression diagrams taken. Changing the compression ratio should be undertaken only by an experienced man.

Yours very truly,
A. G. Elliott

Trade Literature

Tube Cleaners. An unusual catalog recently published by the Roto Company, manufacturers of tube cleaners. The catalog consists of two sections bound in a single cover — a Tube Cleaner Manual, and a looseleaf section describing the company's line. The entire catalog was printed by offset in two colors, and no type or cuts were required. Copy was economically set up with a typewriter on Vogeltype Aligning Paper, producing an even right hand margin, like printing.

It is believed that much of the material contained in the Tube Cleaner Manual has never before been published. Because of the scarcity of printed matter on the general subject of tube cleaners, the time and expense of assembling the information was very considerable.

The regular catalog portion consists of separate sections, each devoted to cleaners for specific types of boilers, stills, condensers, and other heat exchange units. Every catalog is individually assembled, and only those sections are furnished which apply to the prospect's particular requirements. Copies may be had on request at Pacific Marine Review, San Francisco.

The Future of The American Merchant Marine

An Analysis of the History of American Sea Experience and the Marine Efforts of Her Principal Competitors Indicates Our Wise Course for the Future

By Ernest E. Johnson

Chapter V. (Continued)—*A Short History of America's Merchant Marine*

As a result of studies made and careful analysis thereof, the Merchant Marine Act of 1928 was passed. This law gave American shipping the greatest consideration and national aid provided for the upbuilding of the merchant marine since 1817. The development during the war period was purely a war measure and produced an abundance of freighters, generally unsuitable for peace penetration purposes. The 1928 Act was designed to round out the fleet with suitable ships of greater speed, carrying both passengers and freight, and especially adapted for the particular trade in which they were to be engaged.

The 1920 construction loan fund of 125 million dollars was increased to 250 million dollars. Low interest rates, based upon foreign procedure, was agreed to for ships used in foreign trades. Loan grants were raised from 66-2/3 per cent to 75 per cent of the total value of the ship, again recognizing foreign practices, as the British Trade Facilities Acts loaned 80 per cent and even up to 100 per cent of the total value of the ships built, thereby accomplishing a twofold purpose, providing new, modern, efficient ships and furnishing employment to skilled men in an essential industry.

Further, a ten-year mail contract, based upon essential trade routes, size, type and speed of vessel, was provided.

Under this Act shipbuilding again took a spurt and 22 combination freight-and-passenger ships, 7 combination refrigerated ships, 9 tankers, 2 cabin liners, 2 train ferries—a total of 42 ships of 446,875 gross tons—were built under loan grants of $116,034,573.40. In addition, 40 ships were reconditioned under a loan grant of $13,060,464.01.

The loans authorized under the 1920 and 1928 Acts have been 97 in number and total $147,724,537.41. Besides the funds already repaid there is, therefore, more than 100 million dollars available for further construction loan funds.

The mail contracts, when let, specified the frequency of service and certain new building considered necessary, particularly in the combined freight-and-passenger services, for the proper maintenance and improvement of these services. Part of this improvement has been accomplished. Under the mail contracts an additional 21 ships are required to be built.

Considering the universal terrific drop in foreign trade, the fierce and unprincipled cut-throat competition, and the tightness of finances, it is quite remarkable that American shipping has been able to operate at all, even with the remuneration received from the mail contracts.

It must be always remembered that American owners must compete with every industry in matters of finance; that, generally speaking, the American public is not ship-minded, and that foreign sea trade is considered extra hazardous. Even so, the shipping industry has actually invested in new ships, since the 1928 Act became effective, a total of about 60 million dollars. The total program actually undertaken, including war-built ships bought, being about 200 million dollars.

Had not the depression set in right after the 1928 Act became effective we should undoubtedly have seen a much greater number of ships built.

To further handicap the upbuilding of the merchant marine under the favorable 1928 Acts, the political upheaval of 1932 and the consequent numerous investigations, hearings and demands for cancellations of the mail contracts, all of them having several years yet to run, served to put a stop, look and listen signal on every contemplated plan under way for new construction. The spectacular cancellation of airmail contracts had a powerful influence upon any further ship modernization or replacement program. Financial circles were, so to speak, forced out of American shipping, as a result of which, in the last several years, only two small freighters have been built. Our shipyards and skilled shipyard labor have suffered by lack of employment, and our advance in the world carrying trade has received a severe set-back.

In 1845 America set up a mail contract system to meet the British system. After ten years' superior service, at costs far greater than the British costs, and with less mail subsidy, political reasons killed the mail pay and did likewise to American ships. In 1891 we set up a timid try, and failed. In 1928 we declared to the world, and made them believe it, that we must and will have an adequate merchant marine. In 1932 politics again entered the arena and America is again in a fair way to skid out of the foreign overseas picture.

Compare this with the British system. With the advent of the steamer early in the 19th century the British began to pay mail subventions to essential services. They have kept it up ever since. Besides discriminatory or preferential duties, Imperial preference policies such as the Ottawa agreement, Naval Reserve pay to ships, officers and crew, special loan grants, and the like, Great Britain has paid 160 million dollars mail subvention in the past forty years.

Since 1920, and with American ships costing at least 50 per cent (and often a much higher percentage) more than foreign ships of the same type, our government has loaned out a total of less than 150 million dollars for new construction.

Between 1922-1929 the British have, under the Trade Facilities Acts, loaned out £27,487,745; and under the Irish Trade Facilities Act they have, from 1922 to 1934, loaned out £14,909,237, or a total of 206 million dollars. In addition, they have advanced about 50 million dollars to Cunard Line, another 50 million dollars for a scrap-and-build program, and another two million pounds sterling for tramp ship subsidy.

Our loans have been based upon 66 2/3 per cent to 75 per cent of the total costs. The British loans have been based upon 80 per cent to 100 per cent of the total costs.

Our loans have variously been for from 5 to 20 years. Most of the British loans have been for 12 years.

Our interest charges have been from 1/8 of 1 per cent to 5¼ per cent. The British interest charges are nearly all on 3 per cent basis.

The total mail pay for 44 essential trade routes for the year 1933 was $26,054,680.35. The net subsidy amounted to $23,054,223.18, the balance, or $3,000,457.17, being calculated as the actual cost to the government if the mail pay of 80c per pound had been paid to American ships. (We have seen that under the law, but never carried out, the American ships are entitled to $2.20 per pound, or nearly three times the amount above specified.)

Compare the 26 million dollars for the 44 essential routes with French mail pay. For 1935 the French have already appropriated $36,800,000, of which 27 million dollars go to only four major French lines. Twenty-seven million dollars to four French services, 26 million dollars to forty-four American services!

The 1935 Merchant Marine Act provides for strict government supervision, a complicated and highly expensive accounting system, regulation of all kinds, and the danger of limiting individual initiative.

Compare this with the British attitude. Says Mr. Walter Runciman, President of the British Board of Trade: "It should be clearly understood that the government were not going to undertake the running or the ownership of the mercantile marine. None but conceited fools would think of doing anything of the kind."

As if this is not enough, he further states: "We have no intention of interfering with the way in which the industry is manipulated. Freight markets are not understood by politicians, and if they are invaded by amateurs they would be fertile ground for failure."

Said Sir Charles Barrie: "The government are also doing well, in my opinion, to have the shipowners to run the scheme (subsidy) themselves. It is much better to have them to work out their own salvation with the backing of the government than to have too much interference from government officials."

During 1934 and 1935 a Federal Interdepartmental Shipping Policy Committee made a special study of America's merchant marine needs and reported, among other things, that America's immediate naval requirements called for:

61 combination ships of about 488,000 gross tons. Speed ranging from 12 to 18 knots (preferably the latter).

3 combination ships of about 55,000 gross tons. Speed required, 18 knots.

24 cargo ships of about 168,000 gross tons. Speed 10 to 12 knots—preferably higher, as Japan has set the pace.

32 tankers of about 256,000 gross tons. Speed 10 to 12 knots—preferably much higher. Here, again, Japan has set the pace.

20 refrigerator ships of about 100,000 gross tons. Speed 15 knots or over.

All of these are suitable for commercial use.

Based on this report is President Roosevelt's new subsidy plan embodied in the Bland bill passed in the House in 1935, and in the Copeland Bill pending in the Senate. This measure as unimpended by the administration is now being considered in the Senate.

It can be made into an Act that will build an American Merchant Marine consonant with our political position as a major world power, to fill our commercial needs to a safe degree and to be adequate to the needs of our naval requirements. Conversely, it can undo all that the 1928 Act has so far accomplished.

This proposed 1935 measure repeats the Congressional mandate that America shall have an adequate, suitable, modern and efficient merchant marine sufficient to carry at least 50 per cent of our own foreign commerce.

The Act sets up a United States Maritime Authority comprising five members, not more than three from any political party, to be appointed by the President, one each from the states bordering on the Atlantic coast, Pacific coast, Great Lakes, Gulf of Mexico, and one from the interior.

This Authority will have many intricate steamship questions of international character to decide upon; it will have to deal with the keenest steamship and political minds of foreign maritime nations; it will have to consider national needs from a practical steamship standpoint; so that it seems positively mandatory that its members be men of the widest possible steamship experience, particularly in foreign ocean trade.

These are some of the things the Authority must study, determine and recommend or put into effect:

All national maritime problems relating to both domestic and foreign commerce.

Collaboration with shipowners and the Navy in developing plans for the construction and efficient operation of ships.

Determine the direct national financial aid necessary to place American shipowners on a parity with foreign shipowners in the same trade.

Originate means by which earnings can be increased and operating costs decreased.

Cooperate with other government Boards and Departments, and with trade organizations to develop preference for the American ships.

A program for the scrapping of old and obsolete tonnage and the building of new ships.

Disposition of replaced but not yet obsolete ships. Should such ships be scrapped, laid up as reverse ships, or placed in trades where services will be improved?

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Should our merchant marine develop the so-called tramp ships, or the cargo liner, or produce practically all fast and commodious combination freight-and-passenger ships?

Would it be advisable to build and operate expensive and luxurious express super liners of the type of the Queen Mary of the Cunard-White Star Line, or the Normandie of the French Line?

For the proper development of American foreign commerce, what trade routes are essential? What type and size of ship, speed and frequency of service are necessary?

The relative cost of construction of ships in various shipyards located at various coastal districts; the value and strategic importance of such yards and method to be used to overcome difference of building costs as between, say, the Pacific coast and the Atlantic coast.

Determine building and repair costs of a similar vessel in a foreign shipyard as compared with costs in American yards.

Ascertain the relative naval, military and emergency value of ships to be built for foreign, coastwise and intercoastal trade routes.

Determine the exact extent and character of government subsidies, bounties, and the like, granted and paid by foreign governments to their merchant marine, and the effect this has upon the successful operation of American ships in the same trade.

Negotiate contracts with shipbuilders and shipowners found to have the necessary ability, experience, financial resources and character to build and operate suitable and efficient ships on specific trade routes.

Determine whether steamship owners are operating efficiently.

Pass upon freight, passenger, terminal and stevedoring tariffs, rules and regulations.

Pass upon through rate agreements, both domestic and foreign steamship conferences, and their practices.

Determine if and when foreign ships may or should enter new services; whether their rate and contract practices are injurious to the commerce and steamship industry of the United States.

Determine use of "fighting ships" to control unscrupulous foreign competition.

Hold hearings as to any discriminatory practice by any line, which may appear to be injurious to our domestic and foreign commerce.

Cooperate with the Interstate Commerce Committee for the effective regulation of railroads and steamer lines as to through services and rates, competitive features, and the advisability of effective measures for preferential rates on import and export cargoes moved entirely by American ships and American railroads.

Determine and recommend further laws that may help to carry out the mandated program to build up a stable and permanent, privately-owned and -operated merchant marine built of American material with American labor, and manned by American officers and crew.

It is maintained that the above requirements are of such nature and scope that fully experienced steamship men should be appointed as members of this new United States Maritime Authority.

The 1935 Merchant Marine Act, if passed as it now reads, will practically accomplish what no other previous legislation has done—place the American shipowner on a near parity, economically, with foreign owners in the same trade.

This Act recognizes that owners in the Pacific trades have competitive problems to face that are not faced in the Atlantic trades. The Japanese initial and operating costs are far below the same costs of the British, French, German, Scandinavian, and others. The strongest competitors in the Pacific presently are and will be the Japanese, with their new, fast, efficient and economical tonnage.

The greatest drag on operating costs are the heavy charges necessary for interest, depreciation and insurance due to extremely high initial cost of ships, as compared with initial costs of foreign-built ships.

To remove this tremendous drain on earnings, it is considered necessary to have a tri-party contract. After the naval authorities have passed upon the ships plans, the Authority contracts for the building, purchase and operation of the ships; the former with the shipyard selected, presumably Pacific Coast yards for Pacific trade ships, the Atlantic Coast yards for Atlantic trade ships, etc., the latter with the owner deemed acceptable.

The shipowner, in foreign trade only, will secure the ship at a price favorably comparable to the price a foreign shipowner can secure the same or a similar ship from any foreign shipyard of equal standing. Any special naval requirements will be assumed by the government.

To offset the higher operating costs for American ships a subsidy will be paid. This is based upon higher wages, high food costs, higher repair and maintenance costs, and whatever subsidy foreign governments pay foreign shipowners in the same trade.

It must always be remembered that American ships, under our national merchant marine plan, are not out to capture the carrying trade of the world. We are not concerned with fluid tramp ships, scurrying hither and yon as seasonal crops demand. We are purely concerned with the protection of American foreign commerce in essential routes, our ships shuttling between specific ports in America and selected foreign ports, performing regularly a service which may be counted upon by shipper and merchant months, and even years, in advance. For such service the ships must be specially adapted to care for passengers, special classes of cargo, have refrigerated compartments for perishable goods, deep tanks for liquids, strong rooms for valuables, special ventilation and special cargo-handling gear. The speed of the ships must vary with the specific trade and type of cargo to be handled.

For these reasons, most of our new tonnage will undoubtedly be fairly fast, commodious, even luxurious, combination freight-and-passenger ships. In specific trades there will be a few cargo liners to lift rough cargoes and any overflow of cargo which the combination liners cannot lift. Our whole merchant service is based upon frequent, regular, dependable, and fairly fast schedules.

Even so, we are not aiming to carry 100 per cent of our own commerce. Our aim is to have enough ships to carry about 50 per cent or so of our exports and imports in foreign overseas trade. This would assure the Navy of a balanced and adequate complement of suitable auxiliary ships in time of national stress. It would also insure sufficient tonnage to control rates in time of peace, and would prevent farmers, manufacturers, and merchants from suffering intolerable losses such as took place when the comparatively minor Boer

(Page 95, Please.)

Centrifugal Pumps for Oil Cargoes

Several Recent Installations Successful Under Unusually Difficult Operating Conditions

An interesting case of the application of centrifugal pumps to the discharge of crude oil tankers occurs in three ships belonging to the Standard Oil Company of Venezuela.

Each of these three vessels, the S.S. Pioneer of 7805 deadweight tons, the S.S. Herbert G. Wylie of 6650 deadweight tons, and the S.S. Maturines of 8595 deadweight tons, was originally equipped with the conventional midships pump room and two horizontal simple duplex reciprocating cargo pumps.

A new sea loading terminal has been constructed at Guiria on the Gulf of Paria, Venezuela, to receive and store crude oils brought from Caripito, Venezuela, located on the San Juan River. The draft of vessels crossing the Maturin Bar at the entrance to the San Juan River is limited to 23 feet whereas the depth at the new sea loading terminal will accommodate deep laden vessels.

The sea loading lines at Guiria are of 14-inch and 16-inch diameter pipe and the longest extends about 7,000 feet from the shore line. The tanks on shore are on elevated ground, so that, in order to discharge the tankers at the desired rate of approximately 4,000 barrels per hour, the cargo pumps would be required to discharge against a maximum pressure of approximately 160 pounds per square inch.

In order to accomplish this, there was installed in each of the above mentioned vessels one 2800 gallon per minute vertical turbine driven centrifugal pump, as illustrated in the photographs.

The turbines were designed to operate on a steam pressure of 150 pounds at throttle and an exhaust vacuum of 10 inches. A special 10-inch exhaust line was run to the ship's main condenser and radojets installed to provide vacuum. The turbine rotor blades are cut from solid rotor forgings.

Special large suction lines were installed to provide a free flow to the pump sections and extra heavy fittings were used in the discharge piping. Special high pressure hoses were purchased to connect the sea loading line to the pump discharge on the deck of the vessel.

The pumps were designed to handle 4,000 barrels per hour of crude oil having a viscosity of 1,000 S.S.U. and a specific gravity of .94 against a terminal pressure of 150 pounds per square inch. The unit operates at 1850 revolutions per minute.

These pumps have proved very satisfactory in discharging the cargoes from the above three vessels at Guiria, and in view of the success obtained with these pumps, the shallow draft tanker Andino, constructed at Howaldtswerke, Kiel, Germany, for the Lago Shipping Company service on Lake Maracaibo, Venezuela, was equipped with two similar vertical turbine driven centrifugal pumps. In the case of this vessel, the turbines are 310 horsepower at 1850 revolutions per minute, operating under steam pressure of 210 pounds per square inch with 125 degrees Fahrenheit superheat and 26 inches vacuum, and the pumps have a rating of 4,000 barrels per hour at 1850

Standard Oil tanker, Herbert G. Wyllie, in the San Juan River near Caripito, eastern Venezuela.

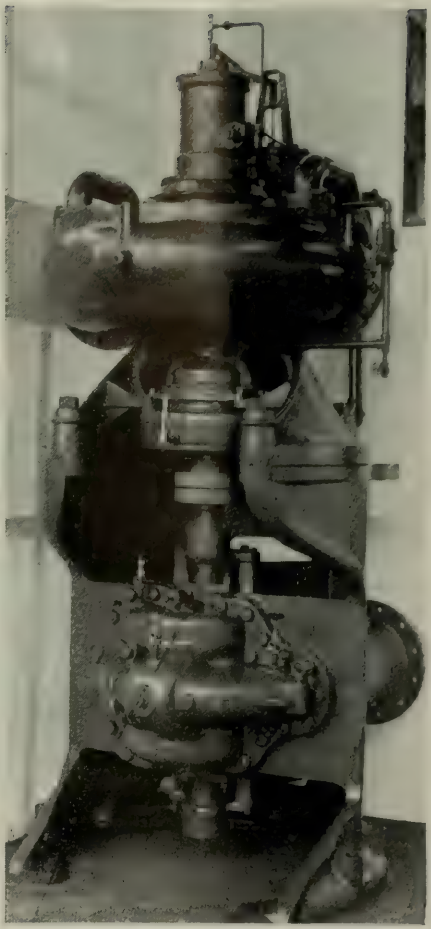
evolutions against total head of 270 eet.

An installation of centrifugal umps for handling petroleum caroes has also been made in the W. S. arish, 20,615 deadweight ton vessel elonging to the Standard Oil Comany of New Jersey. These units are notor driven with motors located in he engine room and the pumps in he adjacent pump room with gasight stuffing boxes in the bulkhead eparating these compartments. The umps, of which there are two, are wo stage, all bronze centrifugals, ated at 2100 gallons per minute gainst a pressure of 100 pounds, oprating at 1150 revolutions per minte. Stripping of the tanks is accomlished by the use of positive dislacement rotary type pumps.

Queen Mary Making Ready for Speed Tests

Preparations are being completed or the important engine tests to vhich the new Cunard White Star Superliner Queen Mary will be subected before she leaves the basin of ohn Brown's shipyard here.

The rigid task of inspection, under he joint supervision of company and hipyard experts, is expected to ocupy several weeks, although prelininary surveys have already been arried out. The four 35-ton propellers have already been temporarily disconnected from their 227 foot long shaftings, and furnaces and boilers lighted, but every particle of the ship's machinery will undergo minute and severe tests in the yards before the actual speed trials, which will take place beyond the Heads of Arran, in the Firth of the Clyde. Prior to proceeding on her speed trials the Queen Mary will leave Clydebank about March 24 next and proceed to Southampton where she will enter the new Southampton drydock to be prepared for the trials some weeks later.



Ingersoll-Rand vertical shaft centrifugal pump with steam turbine drive. Note accessibility of pump and all bearings.

The speed trials of the Queen Mary will be conducted with the utmost secrecy. Not a single soul of the 560 carried aboard, except Sir Edgar Britten, the commander, will know just when the tests have actually begun or ended.

During the speed trials messages will be exchanged between the commander and the engine room in code instead of by telephone, giving details of the vessel's speed and behavior. These messages will be recorded in cipher on perforated tape, similar to quotations on a stock ticker.

For fear that the superliner may swamp yachts and houses on shore during these special maneuvers, the speed trials of the Queen Mary will be carried out beyond the heads of Arran in the Firth of the Clyde, instead of over the usual measured mile at Skelmorlie, off the Ayrshire coast, or in Wemyss Bay.

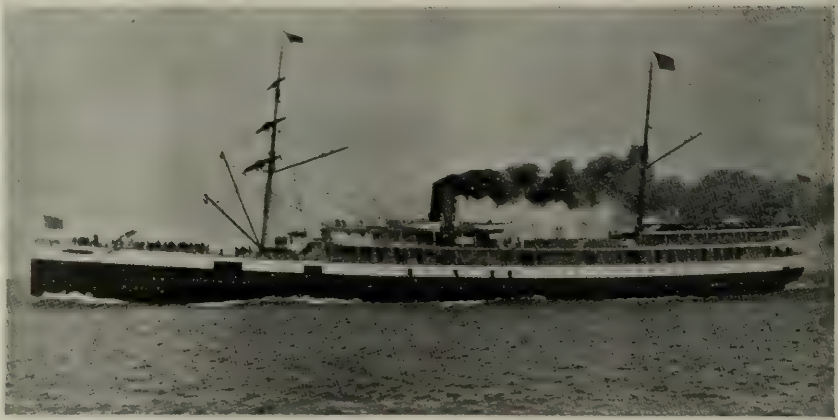
Standard Oil tanker, Pioneer, in the San Juan river near Caripito, eastern Venezuela.

. . . . *Old Time* Pacific Coast Steamships

No. 2—S.S. Queen—By R. J. Alexander

With the Aid and Assistance of Many Old Timers

Last month we recorded the history of the famous old side-wheeler, California, first American steamer in the Pacific Ocean and the first to enter the Golden Gate. Now we are taking a jump of thirty years to record the story of the single-screw brigantine, Queen of the Pacific, not because we are going to ignore those justly famous and uncomfortable steamers which plied this coast from 1850 to 1880, but because we think a presentation of the great Queen to be rather timely, since her last voyage and ignominious end in a scrap pile occurred so recently and was given such wide publicity.


The famous steamship, Queen, in her prime, running 16 knots.

Late in September, 1935, a 53-year old veteran of Pacific coastwise service, an iron single-screw steamer, pulled out of Seattle with a load of steel scrap, both she and her load consigned to Japanese steel mills. She was loath to go and she made the crossing with halting steps, taking 53 days from Seattle to Yokohama, having machinery and other troubles nearly all the way — the same kind of troubles that afflict any elderly person when a world that they have served faithfully and well for nearly two generations shunts them out onto the road "over the hill to the poor house."

The old Pacific Queen has been scrapped in Japan. This vessel was in her day the finest on the coast. In 1876, the old firm of Goodall, Nelson & Perkins had been transformed into the Pacific Coast Steamship Company, and had started with great vigor on an expansive program of servicing the coast ports with marine transportation for cargo and passengers.

In 1880, this firm contracted with William Cramp and Sons, Philadelphia, for an iron-hulled passenger and cargo vessel, then in the Pacific coastwise service. The year 1880 is an interesting one in Pacific Coast maritime history since it was that year that a few far-seeing citizens of San Francisco formed the Union Iron Works, Inc., Engineers and Shipbuilders. Two years later, this firm had its shipyard at the Potrero ready for business, and for twenty years thereafter was an active bidder for every shipbuilding contract let in the United States, and for not a few foreign contracts. As we shall see later, the Union Iron Works was to have its share in the long eventful life of this iron steamer which had the same birth year.

As built, she was officially designated an iron, steam, single-screw brigantine. She had two masts with three square yards on the foremast and fore and aft sails on the mizzen. She was built with two continuous decks and an awning deck on the superstructure. Her length between perpendiculars was 331.2 feet, her beam 38.5 feet, and her loaded draft 21.5 feet. She had 21.2 feet depth of hold, measured 1672 tons net register and 2728 tons gross. A compound engine of two cylinders with 45-inch and 90 inch diameters by 48-inch stroke drove her propeller shaft. She had eight return tubular boilers which supplied steam at 90 pounds pressure, developing enough power on occasion to get better than 16 knots speed for the hull, which was quite fast for such a ship in those days.

Delivered in the summer of 1882, she was brought out to San Francisco through the Straits of Magellan by Captain "Zeke" Alexander. This vessel was so much thought of by her doting designers and owners that they foolishly called her "Queen of the Pacific", a name that has been borne by many good ships, but is usually accompanied by very poor luck. It is as if that sleepy but democratic old giant of an ocean objected to any rule whatsoever. So we find that scarcely a year passes before the Queen of the Pacific is stranded.

In September, 1883, with a large party of notables on their way to witness the driving of the last spike on the Northern Pacific Railroad, she ran onto the Clatsop Spit, and came near to being a total loss. The combined efforts of five tugs finally succeeded in dragging her off into deep water at a salvage cost of $60,000.00. At the time of the stranding she had on board 232 passengers, and a crew of 90 men. She was in charge of A. D. Wass, a very competent Columbia ar and river pilot, but all marks vere obliterated by heavy fog and moke.

Sir Charles Russel, afterwards ord Chief Justice of England, visted the Pacific Coast on a tour of he United States in 1883. During his tour he came from Victoria, B. ., to San Francisco on the Queen of he Pacific. In his book, "A Month n the United States," he says, "The ueen is a very fine and fast ship; nd it is no exaggeration to say that xpense and ingenuity have not been pared in making her the most luxrious boat I ever saw. My apartnent is splendid. I should be content o go in the Queen round even by ape Horn and so home to England."

This paragraph is of interest not nly as showing that this vessel was or her day a superlative coastwise hip, but also as indicating that even hen in her second year of service, er name was becoming abbreviated o simply "Queen", whereas it was ot officially shortened until 1890.

One much advertised feature of he Queen was her famous bridal uite, which for years made her a nost popular honeymoon boat.

Captain Alexander commanded the teamer for many years. Other maseers included such well known names s James Carrol, N. E. Cousins, H. . Thomas, George H. Zeh, Victor nquist, Frank Landstrom, and A. . Nickerson. William H. Allison vas chief engineer of the Queen for nany years.

In 1897, a new engine was instaled in the Queen at the Union Iron Vorks, San Francisco. This was a riple expansion job with 3 cylinders, 27⅛ inches, 43 inches, and 68 inches by 48-inch stroke. She was thoroughly overhauled at the time and much new equipment installed.

The most dramatic and tragic event in the long history of this old-time favorite occurred on February 27, 1904. She was laboring north through pretty heavy weather off the mouth of the Columbia River, when fire broke out in the passengers' quarters aft. Captain Cousins was in charge. His coolness and daring averted a panic. He got his passengers all into boats with a few members of the crew, and veered these boats out aft on a long cable. He and the remainder of the crew fought the fire and after a desperate struggle mastered it. He then got the boats alongside and the passengers aboard again. Checking up showed four passengers missing out of over 200, and ten crew missing out of 90. Four of the missing crew were found to have been trapped by the fire and burned to death. The missing four passengers and the other six of the crew were thought to have drowned after jumping overboard in the first panic following discovery of the fire. Full investigation by the U.S. Steamboat Inspection Service exonerated the officers of the ship from any blame and brought them high praise for their coolness, bravery and presence of mind in the face of a very grave emergency.

It may not be out of place in this issue, which is largely devoted to safety at sea from the shipowners' standpoint, to state here, with all the emphasis possible, that the morale and experience of officers and crew is of far more importance to safe conditions afloat than are any items of equipment which might be installed.

Query: Did the Queen have two famous fires, one off Tillamook, the other off Point Reyes?

Book Review

"The Motor Ship Reference Book for 1936," 12th annual volume, 250 pages of concise statistics and other information relating to motor ships and their machinery. Exhaustive tables revised up to January 1, 1936. A record of every oil-engined vessel over 2,000 tons gross, with essential details of each ship. Published by Temple Press Ltd., London. Price postpaid 5/6.

The volume is copiously illustrated with sectional drawings and photographs of main and auxiliary diesel engines in employment in the mercantile marine. The builders' latest improvements are, so far as practicable, dealt with in the descriptions. It has been the object of the compilers to produce a volume which, in a reasonable compass, shall be an indispensable work of reference to the shipbuilding and marine engineering industries throughout the world.

The importance of the subject which it covers may be recognized from the fact that there are now in service over 11½ million gross tons of motor ships, while on January 1 the diesel-engined ships on order totalled considerably more than 1¼ million gross tons.

Steamer Queen, at left; Steamer George W. Elder, center; and a British sailing ship, in San Francisco Bay, 1892.
From Behrman's collection of old photos.

World's Merchant Shipbuilding

Compiled from Lloyd's Register of Shipping by the National Council of American Shipbuilders

While there was a decided increase in merchant shipbuilding abroad during 1935, no such improvement has taken place in the United States. At the end of the year no less than seventy-five merchant vessels, above 4,000 gross tons each, were under construction in Great Britain, and only four such vessels—all tankers—were being built in American shipyards. Twenty-eight large vessels were under construction in Germany and fifteen in Japan.

Figures show a consistent improvement in British shipyards during the past four-year period. Table I herewith indicates this condition for merchant vessels above 4,000 gross tons each.

TABLE I.
MERCHANT VESSELS UNDER CONSTRUCTION
(Each of 4,000 Gross Tons Or Over)

Date	Great Britain	United States
December 31, 1932	18	4
December 31, 1933	32	2
December 31, 1934	56	2
December 31, 1935	75	4

Throughout the world, there were 157 merchant vessels above 4,000 gross tons under construction at the close of 1935. Details for past four years are given in Table II.

TABLE II.
MERCHANT VESSELS UNDER CONSTRUCTION
(Each of 4,000 Gross Tons or Over)
Under Construction at the Close of the Past 4 Years

Country where building	Dec. 31 1935	Dec. 31 1934	Dec. 31 1933	Dec. 31 1932
Great Britain & Ireland	75	56	32	18
Germany	28	13	1	6
Japan	15	16	14	8
France	5	5	3	3
United States	4	2	2	4
Other Nations	30	28	23	23
Total	157	120	75	62

This table shows that in recent years the United States has been decidedly out-built by Great Britain, Germany and Japan, and also reflects the extent of last year's improvement in Great Britain and Germany. Whereas there was only one merchant vessel under construction in Germany at the end of 1933, there are now twenty-eight.

No merchant vessels between 2,000 and 4,000 gross tons each are under construction in the United States, but there were 21 such vessels being built in Great Britain at the close of 1935, and a total of 51 throughout the world. Detailed figures for this size range are presented in Table III.

TABLE III.
Merchant Vessels, From 2,000 to 4,000 Gross Tons
Under Construction at the Close of the Past Four Years

Country where building	Dec. 31 1935	Dec. 31 1934	Dec. 31 1933	Dec. 31 1932
Great Britain & Ireland	21	11	9	9
Germany	5	3	4	—
Japan	4	1	1	1
France	3	—	—	3
United States	—	—	—	—
Other Nations	18	8	6	11
Total	51	23	20	24

Of the 157 vessels under construction, above 4,000 gross tons each, 58 are steamships and 99 are motorships. A breakdown of this tonnage according to size and type of machinery is given in Table IV.

TABLE IV.
Merchant Vessels, Each of 4,000 Gross Tons or Over
Under Construction on December 31, 1935
Classified According to Size and Type

Size	Steamers	Motorships	Total
4,000- 9,999 Gross Tons	47	77	124
10,000-14,999 "	5	17	22
15,000-19,999 "	3	3	6
20,000-24,999 "	1	—	1
25,000-29,999 "	—	2	2
30,000-50,000 " in Holland	1	—	1
Above 50,000 " (Queen Mary)	1	—	1
Total	58	99	157

At the end of 1935, a total of 59 tankers, each of 1,000 gross tons or over, were under construction throughout the world, aggregating 438,560 gross tons. Fifty-one of these tankers were motorships, the other eight being steamers.

The keels of four tankers, all steamers, had been laid in the United States prior to the close of the year, and these vessels are the only ones reported as being under construction in American shipyards at that time.

The large volume of merchant construction underway abroad is indicative of the fact that foreign nations are continuing to replace their obsolete tonnage with modern vessels.

Largest Liner and Latest Tankers

Insure Safe Navigation with Sperry Equipment

**At left: Standard Oil tanker R. P. Resor.
Above: An interesting bird's-eye view of the Queen Mary at the outfitting dock, Clydebank.**

Of prime importance to the safety f a ship at sea is accurate, dependble control of her rudder, and acurate, dependable indication of diection of her course through the ea. The two new tankers, R. P. esor and T. C. McCobb, built by he Federal Shipbuilding and Dry ock Company for the marine deartment of the Standard Oil Comany of New Jersey, have insured hese vital factors by installing perry Gyro-Compasses and Sperry wo-unit Gyro-Pilots. As an added easure of safety, useful in night avigation, each ship has mounted n her pilot house an 18-inch Sperry ncandescent Searchlight.

It is an interesting fact that the ew Cunard superliner, Queen Mary, when she crosses the Atlantic on her maiden voyage in May, will be guided and controlled by these same efficient aids to safe navigation.

Sperry's Gyro-Compass gives a true bearing at all times, being unaffected by the variations and deviations that affect the magnetic compass. Navigating officers can therefore maintain a truer course with less use of rudder. In connection with the radio direction finder, it enables much more accurate bearings in fog—a very important point in safe navigation.

The two-unit Gyro-Pilot has a controlling unit for automatic or hand steering in the pilot house and a controlled unit aft, which in turn controls the steering engine. The two units are electrically connected. The steering engineroom unit comprises an electric motor for actuating the controls of the ship's steering gear, a magnetic relay panel for controlling that motor, an automatic magnetic clutch for connecting the motor to the controls of the steering gear, and disconnecting it; and an electric transmitter for repeating the movements of the ship's rudder back to the pilot house.

This two-unit Gyro-Pilot, then, in conjunction with the standard hand wheel telemotor system, provides two independent control systems between pilot house and steering engine with three methods of steering:

(1) Automatic steering under control of gyro repeater;
(2) Manual steering by the small hand wheel on the Gyro-Pilot and its electric telemotor; and
(3) Manual steering by the standard wheel through the standard telemotor.

. . . . Clean Boilers Reduce Operating Costs

Some Notes on Soot and Scale and Some Suggestions on an Efficient Method Eliminating These Deadly Enemies to Steam Economy

The sole purpose of a steam boiler is to convert the unworkable energy of a fuel into the workable energy of steam. In marine practice, the fuel is either coal or oil. The combustion of either fuel results in hot gases which are led through metal tubes. Heat in the gases is transformed through the metal walls of these tubes to the water in the boiler and this heat transforms the water to steam.

Unfortunately there are always present two factors which begin to reduce the efficiency of this process almost as soon as it starts. These are: (1) The formation of soot on the heating surfaces; (2) The formation of scale on the heating surfaces.

### ● Soot

Soot is the finely divided unconsumed carbon present to a greater or lesser degree in all combustion gases from hydrocarbon fuels. Its properties as an insulator from heat give it first place among the enemies to efficient operation of marine steam boilers.

Soot from the combustion of fuel oil is much more resistant to the passage of heat than is soot from coal fires. The latter is mixed usually with dust and ash and so does not adhere to the tube or pack so closely as the oil fire soot.

A soot film from an oil fuel fire rapidly envelops the entire circumference of small tubes and as rapidly lowers the efficiency of the boiler. It is stated by authorities that a film of such soot 1/32 of an inch thick over the entire heating surface of a boiler will cause that boiler to require approximately 10 per cent more fuel to produce its normal capacity in steam.

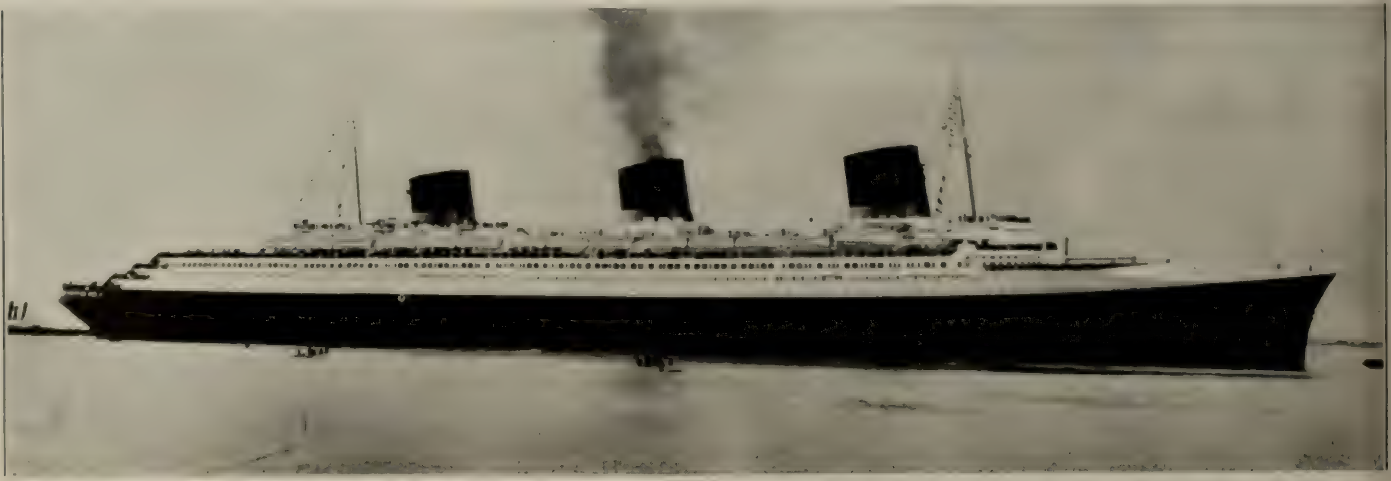
Soot film once formed builds rapidly, and if it be allowed to reach a thickness of 3/16 inch the boiler would require considerably more than twice the fuel to produce its rated output.

Soot as a heat insulator ranks very high. A layer of the finest asbestos one inch thick will transmit more heat than a layer of soot 1/5 inch thick. It is very evident then that the heating surfaces of boilers should be kept as free of soot as is practicable in operation.

● Scale

Scale on the heating surfaces in marine boilers comes usually as the product of some corrosive chemical action. This corrosive action may be due to any one of, or a combination of, several causes.

Lack of thoroughness in cleaning may leave small cakes of soot in pockets where the tube joins the drum or the tube sheet. Moisture from rain, leaky boiler tubes, or atmospheric conditions will mix with this soot cake and start active corrosion at that point. Again, all fuels contain some sulphur. A very minute quantity of such sulphur mixed with a small cake of soot will immediately start corrosive action.



Artists and photographers delight to portray steamers with a pennant of black smoke rising from the stack, as the Normandie is shown here; but such conditions are tremendously expensive to ship operators, and should be immediately corrected, as indicated in this article.

Scale so formed, while it does not have the heat insulation qualities of soot, is very objectionable because its presence interferes with efficient soot cleaning, and its tendency to maintain corrosive action hastens the failure of the tube.

A noted American naval engineer has said, "The importance of clean fire sides cannot be overestimated. Not only does the heat of the fire encounter a greater thermal resistance through the dirt and scale which it must overcome before it reaches the water within the tube, but there will also result local overheating of the tube which will alter the grain structure and reduce its strength. The importance of the part played by boiler tubes in the marine steam plant should never be underestimated. They are the lungs of the installation where the steam energy is generated and they must be treated accordingly."

● Mechanical Cleaning

Practically all marine boilers afloat today are maintained in a more or less clean condition by some mechanical means which is used with prescribed frequency as part of the boiler room operation schedule. The great majority of modern marine boilers are equipped with soot blowers installed permanently in the boiler and used at regular intervals. The use of these blowers has, beyond question, made tremendous savings in the fuel bills of steamship operators and they should be maintained and their use extended and increased.

How long will this white beauty retain her snow-like purity with the soot blowing from her stack? She had better indulge in some internal cleaning, as described in the text.

A soot blower, however, will get loose by no means 100 per cent of the soot, and it can get only a small proportion of the scale. Furthermore, soot blowing at sea, particularly on passenger ships, is a rather unpleasant experience, and renders somewhat costly the maintenance of white paint, immaculate decks, and snowy linen, which are so essential to passenger comfort and the morale of the steward and deck departments.

Recognizing the need for improvement of this condition, the Gendrom Chemical Company, Inc., after extensive research, has developed a chemical compound which—used in conjunction with any of the older mechanical means, and preferably with the soot blower—will maintain the boiler efficiency and at the same time eliminate the objectionable feature of soot blow-off. This chemical compound has been named XZIT fire scale and soot eradicator.

XZIT is a scientifically prepared stable chemical compound. When thrown on the fire in a furnace it forms a gas which permeates all parts of the boiler, the uptakes, and the stack and has a chemical reaction on the soot and fire scale.

The first sign that this chemical is working is the emission of white smoke from the stack and the next is no evidence of soot. Continued application breaks down the binder holding the fire scale on the heating surface and so making it easy to remove. After a time the XZIT will get to the center of the worst scale and crack it, and in two or three weeks the scale will all be loose. When the tube is clean, the continued use of XZIT forms a film on the heating surface which prevents formation of scale and does not interfere with heat transfer.

This compound has been put through practical working tests with every type of boiler afloat or ashore. It works equally well with all types

White is favored for the hulls of ships above the water line; and on many ships it is maintained at great expense. This article describes a scientific method of removing the cause of this expense, and at the same time greatly reducing fuel cost in the ship's power plant.

of watertube, firetube, or return flue boilers, using coal, fuel oil, refuse oil, or waste for fuel.

When using XZIT, the regular schedule for blowing soot and for taking boilers down for cleaning should be continued. Generally, it will be found that the first cleaning after beginning to use XZIT will produce an unusual quantity of scale due to the scale deposits being loosened by the chemical. Each subsequent cleaning will show less scale and finally cleanings will be unnecessary.

Application can be made in a number of ways. Generally, for larger installations, an injector gun is furnished that can be operated either by compressed air or steam. It is important that XZIT be directed to the hottest part of the fire, because the quicker it becomes gas, the better will be the results.

Not the least important of the benefits derived from the use of this compound in marine boilers is the elimination of soot in the stack and uptakes. This results in a number of corollary benefits such as:

(1) No more sparks from the stack;

(2) No more stack fires;

(3) No more soot nuisance on deck with its trail of claims for soiled or ruined garments, high maintenance charges for paint work, and high cleaning costs; and

(4) Minimizing of corrosion in stack and uptakes.

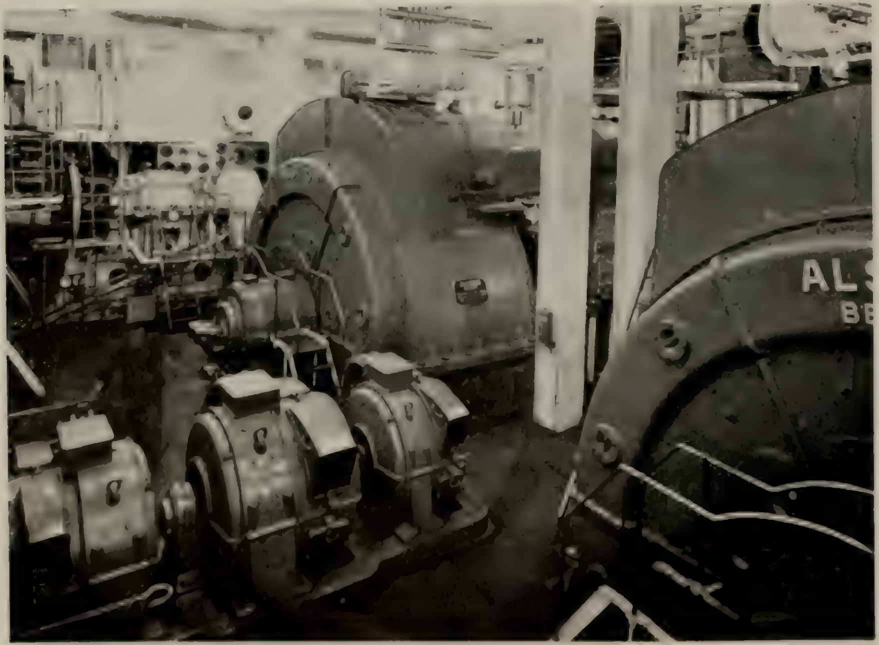
The chief engineers of vessels on the Atlantic and Pacific recognize XZIT as their friend because it removes from their minds all anxiety over the effect of boiler efficiency on their fuel consumption, and at the same time enables them to keep cleaner fire and engine rooms.

The deck gang may not even know its name, but they do know that something has got into those stacks so that now when they clean up they do not find any of the grimy, sticky soot they used to get.

The navigating officer on the bridge certainly blesses it, as he notes with pride the way his "whites" preserve their immaculate appearance for much longer periods than was formerly possible.

The passengers, enjoying a stroll on the promenade and boat decks, note the comfortable cleanliness of these ships and compare them favorably with former unpleasant experiences.

And so, through every department of a passenger liner or cargo vessel there prevails a better feeling, a higher morale, and a more efficient and more economical operation.



As illustrated in the two cuts on this page, the power plant of a modern steamer is a complex, intricate installation, requiring expert knowledge and high morale on the part of the operating personnel. A great asset in maintaining high standards in these qualities and in the efficient functioning of all controls and recording devices is cleanliness. This article describes one of the most modern methods of keeping boilers (and hence the whole ship) free of soot and scale.

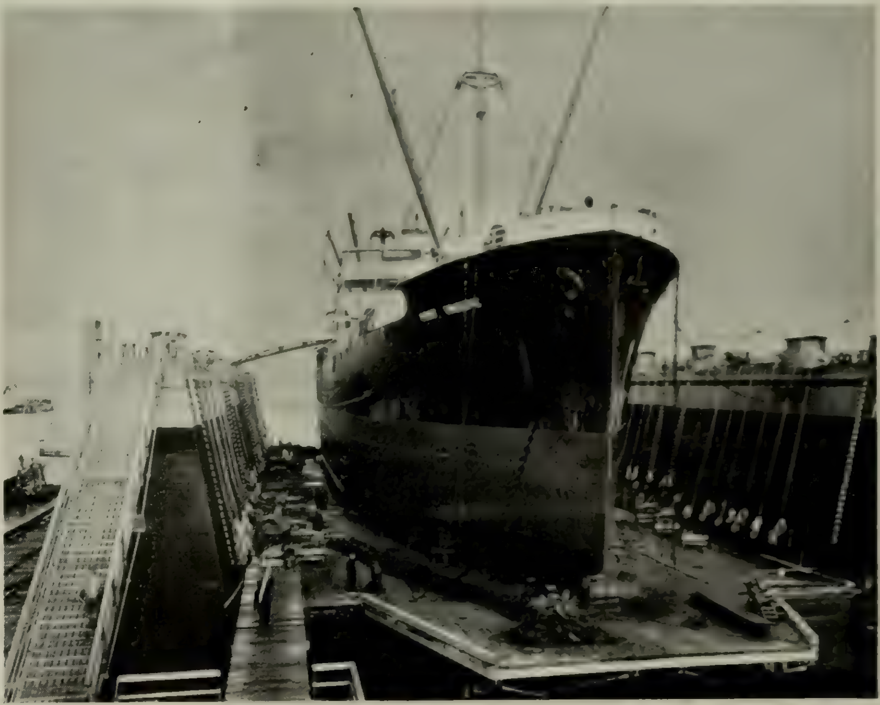
An Interesting Drydock

Todd's Seattle Plant Builds Newest Type of Timber Built Sectional Floating Dock

A new 15,000 ton floating dry dock was put into commission at the Seattle plant of the Todd Shipyards Corporation early in February, under the direction of John D. Reilly of New York, president of the corporation, who made a special trip to the Pacific Coast for this purpose.

The new dock comprises five separate sections, 90 feet in length and 127 feet in width, each one consisting of a rectangular pontoon with a curved bottom, deeper at the center and shallower at the side, with a maximum depth at the center of 20 feet. The first and fifth of the five sections are provided with outriggers or overhanging aprons 36 feet in length, so that the overall length of the structure is 532 feet, and the width of the dry dock deck at the top of the keel blocks is 90 feet, making it possible to lift a ship more than 530 feet in length and with a beam in excess of 80 feet. The pontoons and wing walls, interior framing and watertight bulkheads are all constructed of western fir. Each section has installed in it two electric motor driven centrifugal pumps, one on each side, capable of pumping out the interior water and lifting the ship in less than one hour.

Before undertaking the construction of this new dock, the Todd Shipyards Corporation, which owns and operates 28 dry docks on the Atlantic, Pacific and Gulf Coasts, made an exhaustive study of different types of floating dry docks, preliminary to selecting a structure that would be most suitable for the Seattle location. Preliminary designs and studies of solid trough docks; sectional docks and removable pontoon; solid steel wing wall dock; docks all of steel, all of timber and a combination of both materials; were made by Admiral Frederic R. Harris, the corporation's consulting engineer, and it was finally decided that west coast fir lumber was the most satisfactory and economical material to use.



Four sections of the new floating dock at the Seattle plant of the Todd Shipyards Corporation, with the Steamer Point Vincente up.

The Todd Corporation departed from the usual practice in floating dry dock construction and built a structure with a rounded, instead of the usual flat bottom. The advantage of this is that all the water inside the pontoon can be removed by the pumps. In the heretofore used flat bottom designs 18 to 22 inches of water always remained, decreasing the lifting capacity of the structure to the extent of the weight of that unremoved interior water.

Marine wood borers, such as the teredo and limnoria are prevalent in Puget Sound and it was known, from past experience in Seattle, that these eventually attacked the interior of the timber pontoons and weakened them. With the rounded bottom this interior water will be entirely drained away. To further guard against the destructive effect of these marine worms, the necessary ballast consists of concrete, which has been placed in the bottom of the pontoon in such a manner as to entirely protect the interior timber and do away with any pockets that might confine the interior water and prevent it from draining to the pump sumps.

These features of the dock further serve to increase its stability by lowering the center of gravity and give a greater factor of safety than is usual in this type of structure. The dock is more stable and more rigid when lifting the heaviest type of ship. The rounded bottom furthermore insures that the flotation or lifting effect of the pontoons is concentrated more nearly under the hull of the ship being lifted and by that means insures a far greater transverse strength to the five lifting pontoons.

The steel framed outriggers, pinned or hinged, can be revolved and placed on the deck of the pontoons when it is necessary to dry dock sections 1 or 5 for repair or examination. This new type of outrigger provides a much greater overhang and area than when timber outriggers are used, at the same time making it possible to carry considerable of the weight of the ship overhanging at bow and stern directly on these outriggers.

The Modern Ship and Her Equipment From the Shipowner's Viewpoint

Part I—*Hull and Propulsion Machinery*

By A. J. Dickie

For Engineers

On January 30, 1936, the San Francisco Sections of the American Society of Civil Engineers, the American Institute of Electrical Engineers, and the American Society of Mechanical Engineers held their annual joint meeting. The committee in charge had decided to have the entire program devoted to ships, so they got pictures and models and marine flags with which to create atmosphere in the Engineers' Club; hired the Bucaneers Quartette to sing sea songs; and asked the inimitable John Norman Densham to reminisce a bit at dinner. For the technical session, they arranged two papers to cover present trends in naval architecture and marine engineering. This is a very large subject for a meeting lasting an hour and a half at most, so these papers had to be very much condensed and very general. They were received by the engineers to whom they were addressed with great favor. They are published here in the hope that they may draw constructive criticism and comment from a larger audience.

The shipowner's viewpoint is not generally understood or appreciated by engineers and particularly is it misunderstood by sales engineers. When the circumstances surrounding his business dictate to the shipowner the advisability of building new tonnage for either replacement or expansion, he is faced with a comparatively large unit of investment and a low-average, highly-uncertain increment of profit. The resultant unit must therefore be useful over a long period—hence a conservative attitude—a determination to stick to those types of hull and machinery which have proved themselves at sea over long periods. Consequently, many aspiring and perspiring equipment and machinery salesmen have on numerous occasions likened the mental attitude of the shipowner to that of the Irishman who declared, "Faith, you'll never catch me near the water till I learn how to swim!"

One of the simplest means of gaining greater operating economy is to increase size and carrying capacity. Figures available as compiled by Lloyd's for total world tonnage show fair growth in that factor. For the grand total in 1900 we have 28,422 vessels aggregating 29,043,728 gross tons, or an average size of 1040 gross tons, which by 1934 had grown to 30,997 vessels aggregating 65,576,612 gross tons or an average size of 2100 gross tons, an increase of slightly more than 100 per cent.

In regard to this factor, our own merchant marine has gone way ahead of the vessels of the world. In 1900, America's total fleet was 3,269 vessels with an aggregate gross tonnage of 2,836,235 or an average size of 886 gross tons, which by 1934 had grown to 3,739 vessels, aggregating 13,045,037 gross tons, or an average size of 3530 gross tons, an increase of a little more than 300 per cent. The present average size, however, both as to world tonnage and as to American tonnage, had practically been attained in 1922, and the rise since has been extremely slow.

World tonnage figures of self-propelled vessels classified as to type of machinery and as to fuel give ample evidence of the shipowner's conservatism. No doubt, it will be somewhat of a shock to many of you that over two-thirds of the total number of power plants at sea, and over 50 per cent of the total tonnage, still burn coal; three-fourths of the total number of power plants at sea, and over 70 per cent of the total tonnage is still reciprocating steam engine drive.

The great majority of these coal-burning plants are still stoked by manual labor, and the great majority of the reciprocating steam engines are operated with steam generated at pressures of 200 pounds or less in "scotch" type marine firetube boilers with practically no superheat. Since the majority of these vessels were built and powered during this century, and since they were built by shipowners who were exposed to a perfect barrage of proof that more modern types of steam machinery and/or diesels, combined with possible hull improvements would save a very large portion of their operating expense on a comparatively small increase in investment, it would seem that we have here a grand picture of conservatism run riot.

Another compilation of figures shows the new self-propelled vessels classified by Lloyd's register for each year during the past seventeen. This table represents from 60 to 70 per cent of the total tonnage built in the world during each period. We note a rapid adoption of the diesel engine as a marine power plant; also, that less than 20 per cent of the new tonnage classified by Lloyd's for 1934 was coal burning. These figures show considerable evidence that the conservative shipowner is now listening carefully to the progressive naval architect and the marine engineer.

Conservatism in the shipowner is encouraged by classification societies, by various governmental departments, and by marine insurance companies, all of whom base their approval of improvements on actual sea experience. The attitude toward shore tests is—"Yes, that looks good here. Now show us how it works aboard ship in a storm when handled by a crew who have had no previous experience with it." So much for the shipowner's viewpoint — it is ultra conservative, and very properly so.

● The Ship's Hull

The ship's hull is a unit in our modern commercial transportation system. It gathers a load of freight and/or passengers at a dock or docks for transport over long or short sea routes to other docks. At these docks, a shipment by car becomes a cargo by ship or vice versa. Passengers are merely passengers, whether in plane, train, bus, or ship.

Ship's hulls are measured as to their capacity, weight, and bulk in several ways, all designated tonnage;

Gross tonnage is the total enclosed volume of the hull in units of 100 cubic feet, and is the usual statistical figure;

Net tonnage is gross tonnage less deductions for machinery and certain other spaces, and is the almost universal basis for such assessments against the ship as canal tolls or wharfage dues;

Displacement light is the weight of sea water displaced by the hull with machinery, water, stores, and fuel aboard ready for sea;

Displacement loaded is the weight of water displaced by the hull when her load line is at the surface of sea water;

Deadweight capacity is total carrying capacity in tons, including cargo, fuel, water and stores.

Gross and net tonnage are always rather flexible figures. Certain very slight and allowable changes in superstructure enclosures will render them exempt to gross measurement and so reduce the net and all dues and tolls. Thus, when the Shipping Board was paying the bills and it was desirable to "Advertise the Largest Ship in the World", the registered gross measurement of Leviathan was above 59,000 tons. When she was bought by the United States Lines, almost immediately her registered gross dropped to below 55,000.

The weights, spacings, dimensions, riveting of practically every piece of steel in a ship's hull, and the detail strength design of practically all fittings, machinery and equipment are subject to rules of classification societies, which rules are the result of laboratory tests, and of practical experience. All wrecks and all deformations in ship's hulls are surveyed by the nearest surveyor and his observations and measurements are checked with the results of laboratory tests. This process covering the entire history of the use of steel as a shipbuilding material has built up a body of practical working rules that are not excelled in any other industry.

When a naval architect gets an order for a design or sees an opportunity to sell a design for a ship of any type, there will usually be certain known factors, such as:

Tonnage and classes of cargo to be carried;
Number and classes of passengers to be carried;
Schedule speed desirable;
Cruising radius desirable; and
Limitation on loaded draft.

These factors and the rules of the classification societies give the naval architect a limited range within which he can find scope for his special talents as a designer. His object is to produce the hull that will give the desired performance with the least possible total displacement.

Thorough analysis of a number of known vessels of comparable performance and capacity, enable the naval architect to quickly determine approximate overall dimensions and total displacement of the conventional form vessel needed to meet the given requirements. With the ordinary cargo carrier or with the combination passenger and cargo carrier in small or medium sizes, the naval architect until quite recent years would then immediately get busy on the detail job of adapting to his client's special requirements, a conventional hull of these approximate dimensions. However, during the past 25 years, much has been learned from model towing tank experiments and their applications to special forms of hulls in sea service. Great developments, too, have been made in marine power plants, both steam and diesel, and we have made great strides in the metallurgical arts. The well-informed naval architect, therefore, will carry his analysis further to determine whether his client may profitably and safely use much or all of this new data to acquire vessels that will do the work with greater overall economy.

Since the pay load displacement is fixed by the desired capacity, the only way to reduce total displacement is to reduce weight and space occupied by the hull and/or machinery and fuel. This can be accomplished in four ways:

1. Increasing the propulsive efficiency of the hull;
2. Using stronger steel in hull construction;
3. Increasing the efficiency and economy of the power plant;
4. Using stronger materials in power plant construction.

The first two are the province of the naval architect; three and four are the marine engineer's job. These jobs, however, are overlapping and some very remarkable results can be and have been attained when the architect and the engineer get together and cooperate on the design from the beginning.

The foundation upon which a naval architect has to base all of his work, is the fact that sea water at sea level and normal temperature weighs 64 pounds per cubic foot.

Hence, every cubic foot of water displaced by a floating structure enables that structure to support 64 pounds, including its own weight. If this very homogeneous 64-pounds-to-the-cubic-foot foundation would remain level and motionless, the naval architect would have an easy job, and could calculate with as much nicety and precision as any civil engineer just the right weight of metal to take the strains that would be imposed on his ship considered as a truss, and then plate that truss with water-proof covering of just sufficient strength and stiffness to stand the strain of driving through the water at the required speed and still remain watertight.

But this foundation rolls in great waves, and this ship truss must therefore have sufficient strength so that, when fully loaded, she will neither bend unduly if supported at her middle on the tip of one wave, nor buckle if supported at her extreme ends on the tips of two waves. She must also be able to stand the twisting and warping strains incident to being driven over these waves diagonally—all these stresses alternating perhaps three or four times per minute. As if that were not enough, large chunks of her foundation will often tear themselves loose from these waves, and under the impelling force of fierce sea gales, throw themselves at this hull, or drop on its decks and hatch covers.

chunks perhaps having a volume up into the thousands of cubic feet, and each cubic foot weighing 64 pounds. Yes, the good old hooker must not only be able to take all this and maintain her stability and integrity, but she must drive through it at a speed from 10 to 25 knots. If you can visualize this, you will understand why ships are built so stoutly and why classification societies and shipowners are so conservative.

There is no opportunity therefore to reduce the strength of plates and scantlings indicated by the rules and so save weight in the hull structure. There is, however, considerable leeway in the disposition of weights of materials and in the substitution of high tensile strength steels for ordinary ship steel, and in the substitution of welding for riveting in many parts of the hull.

New disposition of weights in strength members of hull is being given considerable attention, both in this country and in Europe. A notable example of this is the recent research work by an American steel company which produced a new type of buckled plate for bulkheads. As used in tanker construction this type of plate saves 26 per cent of the bulkhead weight as compared with conventional straight plate, angle stiffened, riveted structures; costs considerably less; and gives greater strength and stiffness. The special design of welded assemblies in which the material weights can be disposed to greatest advantage is a new and decidedly beneficial trend in shipbuilding. This is particularly true in the matter of stiffening and double bottoms in the way of propulsion machinery, boilers, and other heavy concentrated weights, or in design of compensating strength members in the way of large openings in decks or sides. In this department of ship design and construction, the marine engineer and naval architect must cooperate to get the best results.

Ordinary ship steel has an ultimate strength of 56,000 to 60,000 pounds per square inch, and an elongation of 20 per cent. It is, of course, possible to get alloy steels of very much higher tensile and some with practically the same elongation. Three considerations limit the careful naval architect in their use: (1) cost, (2) panel stiffness, (3) corrosion. The first and third combined almost limit him to nickel and/or copper steel alloys. The second consideration prevents taking full advantage of the high tensile strength possible, because the thickness necessary for strength might be too thin for stiffness. For these reasons, use of high tensile steels has been largely limited to the very large liners. Thus, on the Normandie, some 6,300 tons of steel having an ultimate tensile of 80,000 pounds were used for outer bottom shell plating, strength deck plating, tank top plating, sheer strakes, and longitudinal framing. The use of this steel is estimated to have saved 1000 tons as compared with full mild steel construction. Mathematical analysis on the hull structure of the Normandie indicated that if she were placed on a wave 755 feet long and 24 feet high the tensile on promenade deck plating and sheer strakes would be approximately 16,000 pounds per square inch, and the compressive stress on bottom plating 13,000 pounds per square inch. The finished hull of Normandie contained 27,500 tons of steel. A proportional saving by this method on the hull of a 450-foot cargo vessel might get rid of 100 to 125 tons of weight in the hull but in doing so might produce a dangerous lack of panel stiffness.

Welding presents great weight saving possibilities. It is not yet permissible to completely weld a hull of any great size. However, in the construction and fabrication of any hull, welding is permissible in many joints, and in the great majority of hulls permissible welding will eliminate from 5/8 to 2/3 of the rivets. A recent approved American tanker design which took advantage of high tensile steel, all permissible welding and the buckled plate type of bulkhead design referred to above, shows a saving in weight of steel in the hull of about 23 per cent as compared with the present normal practice for a hull of same capacity fully riveted. This weight saving would be apportioned approximately -- 5 per cent to the buckled plate bulkhead, 3 per cent to a new arrangement of bulkheads, and 15 per cent to welding. This weight saving results in either larger carrying capacity or smaller hull for equal carrying capacity.

Having arrived at a satisfactory saving of weight in his hull structure, the naval architect is now ready to investigate improvements of form for greater efficiency. This efficiency is the ratio between the power necessary to overcome the resistance of the water to the ship's passage, and the power delivered by the power plant to the propeller shaft. From the published results of model towing experiments in the world's great towing tanks, our architect will be able to get effective horsepower requirements for fairly comparable models over a wide range of sizes and speeds and so will be able to approximate the power required. He will, also, by close analysis of the tank experiments, be able to reduce this effective horsepower requirement.

For instance, it has quite recently been demonstrated (first, I think, on the Bremen and Europa) that the lapping of bottom and side plating, so that the outside lap has its edge pointing forward instead of aft, will save as high as 8 per cent in total horsepower requirement. This is true even in slow speed vessels, particularly when the edge of the plate is quarter rounded. A recent American towing test with a model for an 11-knot hull design demonstrated a saving of 5 per cent by this very simple expedient.

Some proprietary forms such as the Maierform bow, the Isherwood Arcform, and the Yourkevitch form, offer very good opportunities for improved performance.

There is great possibility in the analysis of certain methods of increasing the propulsive efficiency. The bulbous bow comes under this head. Its chief advantage seems to be in so forming the bow wave that the ship at normal speed will have a wave crest and not a wave hollow over her propellers.

Streamlining of rudder posts and rudder, contra propellers and contra rudders all help in this matter, and it is apparently possible for a given displacement and speed through the use of combinations of these devices to reduce required power by from 12 to 18 per cent.

● Power Plant

All of these savings being passed on to the marine engineer, as power reductions, may enable him to safely cut the output of his plant by approximately 25 per cent for the given speed and carrying capacity; which, in turn, effects considerable weight and space saving in the engine room and fuel spaces.

In basic terms, every power plant afloat today is a mechanical scheme for releasing by combustion and energy contained in a fuel, for translating that heat energy to mechanical energy in the form of rotary motion, and for converting that rotary motion into forward or astern progress of the hull.

The application of such power plants to the propulsion of ships in regular commercial trans-oceanic transport of passengers and cargo is in a sense just 100 years old. Since the whole conception of that project arose in the mind of a famous British civil engineer and since it illustrates very well the benefits of cooperation between engineers, architects, and shipbuilders, we may well pause to give that civil engineer the credit for much of the progress of modern shipping.

In October, 1835, the directors of the Great Western Railway were discussing the enormous length of the proposed railway from London to Bristol. Isambard Kingdom Brunel, engineer of the railway system, exclaimed, "Why not make it longer? Build a steamship, call her the Great Western, and use her to connect Bristol with New York!" At first treated as a joke, this suggestion soon received serious consideration. Brunel conferred with naval architects and shipbuilders and early in 1836 presented an engineering analysis showing the complete commercial possibility of such an undertaking. Followed then, the building of the steamship, Great Western, to designs perfected by Brunel, collaborating with that father of modern steel naval architecture, Scott Russel. The initial voyage of this ship was the establishment of regular commercial steam service on the North Atlantic Ferry lanes.

Brunel is given credit for the basic empiric rule that as the overall dimensions of a vessel are increased, her cubic capacity will increase at a faster rate than will her area of underwater surface. In other words, and roughly, if the overall dimensions are doubled, the resistance to passage through water at any given speed will increase fourfold while the cubic capacity or tonnage will increase eightfold. A judicious application of this rule enabled Brunel and Scott Russel to design hulls and power them, such as the Great Western, Great Britain, and Great Eastern — all, and especially the last named, way ahead of their time.

Marine propulsion power plants may be divided into two classes—external combustion heat engines and internal combustion heat engines. In each class there are a number of types. Great and bitter foreign war has long been waged between the classes. Equally great and bitter civil war has long been waged between types in each class. While this warfare and the consequent cut-throat competition has oftentimes warped engineering and shipowning judgment, nevertheless it has had considerable value in promoting rapid progress in both classes.

All power plants primarily actuated by steam are, of course, in the external combustion class. This class has been pushed so hard by the success of the internal combustion or diesel class that it is now fast approaching the development of a marine power plant which will for all practical purposes aboard ship be an internal combustion steam plant. The internal combustion class of plant on the other hand is now, in its most modern installations, affecting the great overall savings by utilizing for steam generating purposes, the waste heat of its exhaust gases. Thus, many of the finest internal combustion engines afloat today have assumed in addition to their main function of propulsion, the role of an external combustion appendage to a steam boiler.

The possibilities of weight and space saving design in both classes of marine power plant are along the same lines—increase in working pressures and temperatures of the gas used to actuate the prime mover; increase in speed of rotation of prime mover. It is indeed fortunate for the marine engineer that increase in economy of fuel lies right along these same lines.

Metallurgical considerations at present set the working temperature limits at about 1000 degrees Fahrenheit—working pressure limits at present available in a marine power plant being about 1400 pounds per square inch. The range between average conditions at sea and these limits is tremendous and offers opportunities for overall savings that would have very widespread economic influence.

On the matter of increasing speed of rotation of the prime mover, seagoing plants are limited by the narrow range of speeds for economic propeller design. To offset this limitation, engineers have interposed between the propeller shaft and the prime mover devices for speed reduction. Mechanical gearing so far seems to have the edge on efficiency of transmission. Electrical gearing gives great flexibility in control and in arrangement of weights.

Two widely different types of ship recently delivered in Europe illustrate the practical benefits of designing the ship and her power plant as a unit.

(To Be Continued)

The American Merchant Marine

(Continued from Page 81)

War and the Russo-Japanese War drew a number of foreign ships away from our shores; and the catastrophe in 1914, when our foreign commerce came to a complete standstill for months.

Economic barriers to our owning a fine fleet of merchant marine ships must be removed.

Above all, a long-period, steady, forward-looking program is necessary. The ships are costly. Once built, they must be operated. Their span of usefulness should be about twenty years. That is our minimum forward-looking span of time.

We have the traffic. It is essential to the welfare of the great American public.

Ships are essential to this traffic. American ships must be provided in number, type, size, speed and essential features found to be necessary.

To properly care for American foreign trade, America needs a merchant marine for overseas services of from six to ten million gross tons.

Let us unite on the main idea, eliminate endless debates, carry out our recognized mandates.

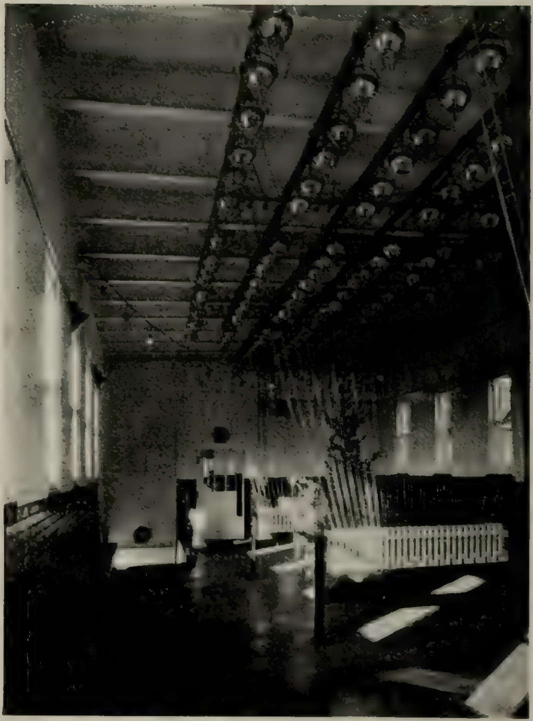
The eminent British authority, "Fairplay," states: "So far as owning a large mercantile marine is concerned, it is recognized that it is inevitable that a country like America must possess one and would have to subsidize it."

Marine Insurance Review

Comfort, Efficiency and Safety

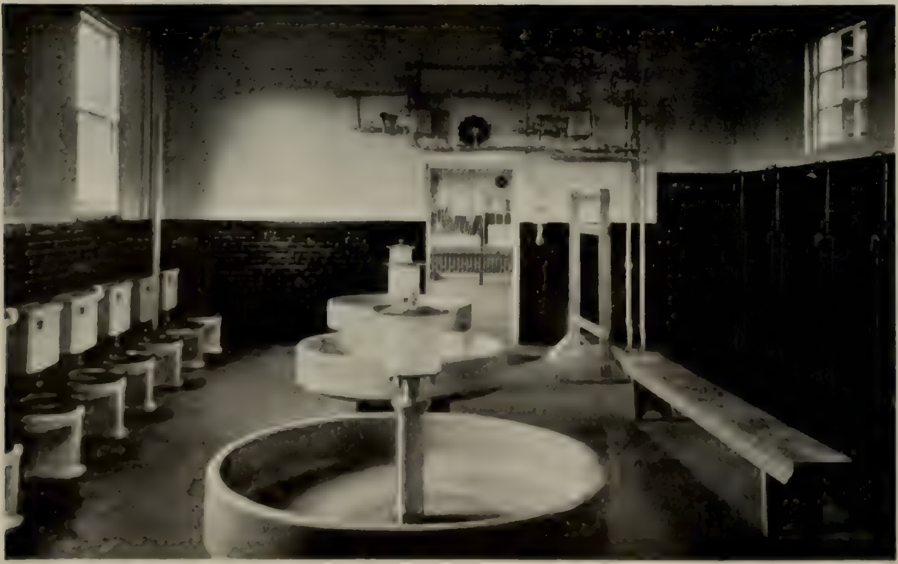
New Welfare Building at Bethlehem Plant Promotes Morale and Safe Working Conditions

As part of its improvement program during the past year Bethlehem Steel Company, Bethlehem, Pa., completed and placed in service one of the most modern welfare buildings of its kind. A glance at the illustrations will establish the date that it was turned over to the workmen employed in the Merchant Mills, Lehigh division of the Bethlehem, Pa., plant.



Dressing room, featuring clothes baskets suspended from ceiling with locked chains. See text.

Built to accommodate 977 men in three-shift spreads, this two-story brick and steel-reinforced building encloses an area slightly in excess of a third of an acre, which is divided into three spacious rooms per floor. At the front of the building is the clock room through which these employees gain entrance to this section of the plant. Two other rooms on this floor are assigned to mill men, as they are designated, who, by the nature of their work dress differently than the men who are assigned to the upper floor. Because of the heavy shoes and other protective trappings they must wear, they are restricted from using the stairways as a safety measure within the building. These two rooms are each equipped with eight individual showers, two of the latest type 54-inch diameter wash fountains, and individual clothes baskets on chains suspended between ceiling pulleys and locking racks.



Lavatory, featuring wash fountains, showers, and (over the door) steam jet water heating equipment.

On the second floor the three rooms are used by men engaged in different classes of work. One is for chippers, one for grinders, and the other for maintenance men. In these three rooms there are 18 individual showers, five wash fountains, and the usual toilet facilities. The purpose behind the divisions set up as described is to prevent confusion during a change of shifts so that the greatest number of men can be accommodated within the shortest period of time.

Steam heat is provided within the building and distributed through separate heat diffusers of a type that can be used in summer as air-conditioning units, simply by reversing the operation. Also, each room is provided with the necessary forced-

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draft ventilators and draft shields to protect the men while under the showers.

An outstanding feature is the method employed in heating the water used in the showers and wash fountains. It is automatic in operation and uses live steam as the heating medium. As water is drawn in either wash fountain or shower a sufficient amount of steam is injected into the system to bring and keep the running water at a predetermined temperature.

Walls and ceilings are painted white, with black trim to the level of the windows. Each change of shift includes a janitor per floor who exercises supervision over the use of these quarters and washes floors and wash-room facilities at the end of each shift.

Marine Insurance Notes

To Tow and Assist. The Institute of London Underwriters, in order to clarify the meaning of Clause 3 of Institute Time Clauses — Hulls, on January 1, 1936, adopted the following wording for this important item known as "To Tow and To Assist."

"The vessel is covered subject to the provisions of this policy at all times and has leave to sail or navigate with or without pilots, to go on trial trips and to assist and tow vessels or craft in distress, but if without the approval of underwriters the vessel be towed, except as is customary or when in need of assistance, or undertakes towage or salvage services under a pre-arranged contract made by owners and/or charterers, no liability shall attach to this policy for any claim arising from a casualty occurring during the period when so engaged. This clause shall not exclude customary towage by the vessel in connection with loading and discharging."

Brokers' Fees: The Institute of London Underwriters came to an agreement early in the summer of 1935 that for all closings made on, or after, July 1, 1935, and which were subject to not more than 5 per cent brokerage and 10 per cent discount, an allowance to brokers should be granted as follows:

(A) ½ per cent off the gross on hulls and/or shipowners' interests for time or voyage and/or all other insurances for time including building risks.
N.B.—Return premiums in all cases to be calculated and inserted in the policy on a net absolutely basis.

(B) 2½ per cent off the **net** on cargo for voyage and/or specie and/or registered post and/or other transit risks generally.

This agreement was conditional upon brokers giving an undertaking not to refund any part of the allowance to any firm or individual.

Both to Blame Clause. Both the London Institute and Lloyds' Underwriters Association, although they do not consider this clause desirable, have agreed to recommend to underwriters, that, in the event of the "Both to Blame Collision Clause" being incorporated in bills of lading, they cover the assured from any incurring liability with an endorsement on the policy in the following form:

"In consideration of an additional premium of ... this policy is extended to indemnify the assured against such proportion of liability under the bill of lading Both to Blame Collision clause as is in respect of a loss recoverable under this policy."

Or with a separate policy, where desirable, to be issued in association with the cargo policy and worded as follows:

"This policy is only to indemnify the assured against such proportion of liability under the bill of lading Both to Blame Collision clause as is in respect of a loss recoverable under policy No......

Salvage Monopolies. A recent Italian Royal decree indicates that all craft assisting or salvaging vessels in distress off the coast of Italy, or any Italian colony, must procure a special license, and that all directors of salvage companies and all crews of salvage vessels, operating in Italian waters, must be of Italian nationality.

Fires at Sea Decreasing. Liverpool Underwriters' Association figures indicate that the number of fires at sea is gradually decreasing. In 1935 there were reported 292 cases of fires in steamers and motor ships of 500 tons gross and over. The comparable figure for 1934 was 278. However, the average number of such fires at sea per year for the decade 1925-1935 was 436, so that over the 10-year period, there has been a very appreciable decrease.

There were 26 serious fires in

MARINE INSURANCE DEPARTMENT
BALFOUR, GUTHRIE & Co., Limited
AGENTS FOR
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Insurance Co., Ltd.
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Fire Insurance Co., Ltd.
(Marine Department)
CANTON
Insurance Office, Ltd.
Louis Rosenthal Co., Ltd.
General Agent
302 California Street

1935, of which nine were in British ships, and the remainder under other flags. Twelve out of the 26 serious fires resulted in constructive total losses. Of these 12 total losses, 2 were British and 10 of other flags. The largest of the 12 was the Italian vessel, Ansonia, of 13,000 tons gross.

San Francisco Election. At the annual meeting of the Board of Marine Underwriters held in San Francisco, February 11, 1936, A. B. Knowles, marine manager for the St. Paul Fire & Marine Insurance Company, was elected president, succeeding J.R.F. Servaes of the Pacific Marine Insurance Agency, who has served very acceptably during the past year. H. J. McCauley of the Insurance Company of North America was elected vice-president, and J. Waddington re-elected secretary-treasurer.

Ice Damage. The long-continued extreme cold on the Atlantic coast has caused great damage to shipping through the presence of dangerous ice masses in harbors and rivers, as far south as Chesapeake Bay. Losing of rudders, breaking or bending of propeller blades, and injury to shell plating have not only brought loss to underwriters, but also much costly delay and expensive claims to shipowners. The severe cold and icy conditions also led to a much greater frequency of accidents and near accidents in handling cargo. Altogether, this record cold snap has cost the shipowner and the insurance underwriters a lot of money.

ROY C. WARD GEO. B. DINSMORE WILFRED PAGE
GEO. E. BILLINGS CO.
308-12 CALIFORNIA STREET, SAN FRANCISCO GArfield 3646
INSURANCE
BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

Freights, Charters, Sales

February 19, 1936

We have the following fixtures to report:

Grain: British steamer Hadleigh, British Columbia to Chatham and London, 21/-, f.i.o., January; British steamer Ethel Radcliffe, British Columbia to United Kingdom, February, Anglo Canadian Shipping Co.; British steamer Riverton, British Columbia to picked ports U.K./Cont., February 21/-, J. Coughlan & Co. Ltd.; British steamer Clarissa Radcliffe, Vancouver, B.C. to U.K./Cont., 21/9, February; British steamer Selvistan, British Columbia to U.K., Jan./Feb.; British steamers Ashleigh and Ullapool, British Columbia to Avonmouth,, February, Empire Shipping Co.; British steamer Umberleigh, British Columbia to London, February, Empire Shipping Co.; British steamer Arlington Court, British Columbia to Hull, Feb., Anglo Canadian Shipping Co.; Greek steamer Mount Pera, British Columbia to U. S. Atlantic, Feb., Anglo Canadian Shipping Co.; British steamer Nurtureton, British Columbia to London, Feb.; Anglo Canadian Shipping Co.; Norwegian steamer Theodore Roosevelt, British Columbia to U.K. Mar., Anglo Canadian Shipping Co.; British steamer Harpalion, British Columbia to U.K., Feb., Canadian Transport Co.; British steamer Quarrington Court, British Columbia to U.K., Mar., Canadian Transport Co.; British steamer Tredinnick, loading North Pacific, Feb., Canadian Transport Co.; British steamer Thistleford, British Columbia to U.K., Jan., Canadian Trading Co.; A British steamer, San Lorenzo to Los Angeles/Vancouver range, 14/9, Feb.; British steamer Bradburn, British Columbia to London, 19/3, Feb.; Greek steamer Eugenia S. Embiricos, British Columbia to U.K., Feb., Canadian Trading Co.; British steamer Badjestan, British Columbia to U.K./Cont., Feb., Montreal Shipping Co.

Corn: Greek steamer Andreas, and British steamer Trecarrell, Argentine to North Pacific, Jan.

Lumber: British steamer Trelissick, British Columbia to Sydney, £3700, lump sum, f.i.o., Jan./Feb.; British motorship Tolten, British Columbia to Shanghai, Jan./Feb.; British steamer Ugada, British Columbia to Sydney, option China, £3800 lump sum, Feb./Mar., Anglo Canadian Shipping Co.; China steamer Chinyuen, British Columbia to Japan, Feb., United Ocean Transport Co.; Danish motorship Nordfarer, British Columbia to Taku Bar., Feb., Dant & Russell; British motorship King Stephen, British Columbia to South Africa, Mar., Canadian Trading Co.; British steamer Tremeadow, British Columbia to Sydney, £4000 lump sum, Feb., f.i.o., H. R. McMillan Export Co.; American steamer American Oriole, North Pacific to U.S. North of Hatteras, March; Norwegian motorship Tyr, British Columbia to U.S. North Atlantic, Feb./Mar., Canadian Transport Co.

Tankers: British tank steamer Athelchief, California to Japan, 15/6., Feb., Mitsubishi Co.; British tank steamer El Aleto, California to Japan, 16/6, Feb. Asano Bussan; Br. tank motorship Athel ——, California to Japan, dirty, 13/3, March; Norwegian tank motorship Nore, California to Japan, dirty, 13/-, Feb.; Norwegian tank steamer Sir Osborn Holmden, California to Japan, dirty, 14/-, option second voyage 13/6, option third voyage 13/-, Feb.; Norwegian tanker motorship Barbro, California to Japan, dirty, 13/-, Jan.; Swedish tank motorship Capella, California to Japan, 15/6, February, Mitsubishi Co.; British tank steamer Athelcrown, California to Japan, dirty, 14/-, Feb.; American tank steamer Spencer Kellogg, California to Formosa, dirty, 55 cents, Apr.; British tank motorship Athelchief, California to Japan, dirty, two voyages 15/6, Feb.; Norwegian tank motorship Nordanger, California to Japan, dirty, 15/-, 5 voyages, Feb.; Norwegian tank steamer Alexandra Hoegh, California to U.K./Cont., dirty, 18/9, March.

Time Charter: British motorship Ary Lensen, delivery Europe, redelivery U.S. Atlantic, via North Pacific, $1.10 prompt; Norwegian tank motorship Orion, thirty months, delivery California, 6/-.

Shipping Sales: American steamer Stanley Dollar, Robert Dollar Co. to The Madrigal Co. of Manila; Norwegian tank motorship, U.S. Marshall at San Pedro to Andres Jahre of Norway, $36,000; Wal Tug El Cano U.S. Marshall at San Pedro to Pacific Ocean Products Co., $4,000; American steamer Marsodak, Charles Nelson Co. to eastern parties; American steamer San Pedro, Hammond Shipping Co. to Oliver J. Olson; American steamer Santa Ana, American steamer Santa Elisa, Grace Line to Alaska Steamship Co.; American steamer Santa Cecelia, Panama Mail Steamship Co. to Merchants and Miners Transportation Co.; American Steamer Castle Town, The Chas. Nelson Co. to John Rosenfeld's Sons.

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111 West 7th St. Los Angeles

Progress of Construction

The following Report Contains all the Data Available Concerning the Shipbuilding Work in Progress at the Leading Shipyards of the United States as of February 1, 1936

EDITOR'S NOTE: As of February 26, all unions except the machinist's had signed an agreement regarding working conditions and wages for the period of one year; and shipyards are now beginning to go ahead confidently expecting that their troubles will soon be settled equitably.

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)

San Francisco

NEW CONSTRUCTION: Order placed for **DD400** and **DD401**, two 1500-ton destroyers for U. S. Navy; no dates set.

FELLOWS AND STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **Hull No. 637, Fellows-Craft V8,** cruiser for Fellows & Stewart, Inc.; L.B.P. 30′; beam 9′; loaded draft 2′3″; speed loaded 16 miles per hour; 90 i.h.p. Kermath V-8 gasoline engine; keel laid June 1, 1935, launched Aug. 1.

Four cruisers for stock; L.B.P. 30′; beam 9′, loaded draft 2′3″; speed loaded 16 m.p.h.; 90 i.h.p. Kermath V-8 gasoline engines; keels laid Oct. 10; completed and delivered.

Hull No. 647, Fellows Craft Universal, L.B.P. 35′, beam 11′, draft 4′6″, sail area, 450 sq. ft., sloop rig; engines twin 30 horsepower, universal flexifour; keel laid November 25, 1935; estimated delivery March, 1936; 95 per cent complete Feb. 15, 1936.

Auxiliary cutter for R. S. Cooper, Burbank, Calif.; L.B.P. 43′3″; beam 12′0″; draft 6′5″; length water line 31′9″; sail area 1061 sq. ft.; motor Kermath Sea Bird; 30 h.p. motor with 2 to 1 reduction gear; propellers 3-blade Hyde feathering; keel laid Feb. 17, 1936; delivery estimated 90 days; designer John J. Alden, Boston, Mass.

GENERAL ENGINEERING AND DRYDOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

Plant closed due to labor conditions.

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Lurline, S.S. Steel Scientist, S.S. Makiki, S.S. Maui.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

No work. Employees on strike.

THE MOORE DRYDOCK CO.

Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: Vessels tied up at plant—no work performed:

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: **1 motor tug**—docked, cleaned, painted, misc. hull and engine repairs.

12 Ship Repair jobs not requiring docking.

33 commercial jobs.

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); LBP, 334′; beam, 35′ 1/8″; loaded draft, 10′10″; geared turbine engines; express type boilers; keel laid August 15, 1934; estimated launching, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); LBP 334′; beam, 35′⅛″; loaded draft, 10′10″; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; estimated launching, Dec. 31, 1935.

Two 1500-ton destroyers for U. S. Navy; order placed August 21 1934: **DD392, Patterson,** keel laid July 23, 1935; and **DD393, Jarvis,** keel laid August 21, 1935, estimated completion dates, February 1, 1937 and May 1, 1937, respectively.

Construction of **Destroyer No. 408** authorized.

Care and Preservation (out of Commission): **Aroostook, Jason, Kearsarge, Patoka, Pawtucket, Prometheus, Pyro.**

DRYDOCK, PAINT, MISCELLANEOUS: **Oklahoma, Arizona, Pennsylvania, Nevada, Swallow, Mahopac, Tatnuck, Challenge, Wando.**

TODD SEATTLE DRY DOCKS, INC.

Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Cuzco, M.S. Chippewa, S.S. Andrea Luckenbach, S.S. Julia Luckenbach, S.S. Ulla, S.S. Virginian, S.S. North Sea, S.S. Golden Coast, S.S. Nizina, S.S. Latouche, S.S. Derblay.**

UNITED STATES NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION: **Smith,** Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery May 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.

Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154′; beam 38′; two i.h.p. Atlas engines; keel laid May 25, 1935; launched Jan. 14, 1936; delivery date not given.

Hull No. 114. One purse seine boat; 82′ L.B.P.; keel laid September 1, 1935.

Orders received for 4 purse seine fishing vessels. Complete data next month.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.

Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges;** 132′ x 35′ x 10′; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; 6 delivered; further deliveries before March, 1936.

Six standard steel coal barges, 175′ x 26′ x 11′ for Tri-State Transportation Inc.

BATH IRON WORKS

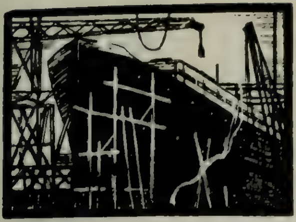
Bath, Maine

NEW CONSTRUCTION: Hull No. 159, **Drayton (DD 366),** torpedo boat destroyer. U.S. Navy; keel laid, March 20, 1934; launching, no date set; estimated delivery April, 1936.

Hull No. 160, **Lamson (DD 367),** torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launching, no dates set; estimated delivery, June, 1936.

Hulls Nos. 161, 162, and 163; **DD394, DD395 and DD396;** Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively.

Hulls Nos. 164, 165, and 166, trawlers, single screw, steel, diesel propell-



American Shipbuilding

Edited by M. J. Suitor

ed, for delivery in July or August, 1936, to Boston, Mass., owners.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA-39, Quincy,** 10,000 tons. Keel laid Nov. 15, 1933; launched June 19, 1935; estimated delivery March, 1936.

Heavy Cruiser CA44, Vincennes, 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD360, Phelps, keel laid January 2, 1934; launched, July 18, 1935; estimated delivery, February, 1936.

DD361, Clark, keel laid January 2, 1934; launched October 15, 1935; estimated delivery February, 1936.

DD362, Moffett, keel laid, January 2, 1934; launched Dec. 11, 1935; estimated delivery April, 1936.

DD363, Balch, keel laid, May 16, 1934; estimated delivery, June, 1936.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

CHARLESTON DRYDOCK CO.
Charleston, S.C.

DRYDOCK, PAINT, MISCELLANEOUS: **Yacht Winyah, Dredge Howell, Yacht Clarinda, Tug Hinton, Launch Anna, Tug Wm. P. Congdon, Yacht Prosit, Yacht Nicoya, S.S. Shickshinny, Tug Waban, Launch Wando, Tug Santee, Tug Robt. H. Lockwood.**

COLLINGWOOD SHIPYARDS, LTD.
Collingwood, Ont.

PAINT, DRYDOCK, MISCELLANEOUS:

S.S. Normac—Freight and passenger. Owen Sound Transportation Co. Ltd. Bottom damage repairs.

S.S. Dalwarnic—Bulk freighter. Canada Atlantic Transit Co. Ltd. Bottom damage repairs; new stern tube; painting, etc.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One yacht,** L.B.P. 115′, beam 17′-6″, loaded draft 5′-6″; speed loaded 17 miles per hour; keel laid February 15; estimated launching October 15; estimated delivery, April, 1936.

Sun Building Four More Tankers

Four large tankers, in addition to the two for the Gulf Refining Company, are under way at the Sun Shipbuilding and Dry Dock Company yard, Chester, Pa. Two of these are for Socony-Vacuum Company and two for the Pan-American Petroleum Corporation. All four are identical and all four are being built under the supervision of Nicolaas J. Pluymert, naval architect, of the Socony-Vacuum Oil Company.

The principal characteristics of these vessels are:

Length overall	501 ft. 7½ ins.
L.B.P. (Lloyd's)	485 ft., 6 ins.
Beam molded	68 ft. 0 ins.
Depth molded (upper deck)	37 ft. 0 ins.
Designed molded draft	29 ft., 8½ ins.
Cargo tank capacity (approx.)	5,450,000 gal.
Bunker fuel capacity	1280 tons
Block coefficient (Lloyd's length and molded draft)	.757

On allowable summer freeboard, and a draft of 29 feet, 10⅞ inches, each of these vessels will carry a total deadweight of 15,400 tons.

The hulls—of the single-deck type, with straight raked stem, and cruiser stern—will be built on the longitudinal bracketless system of construction with machinery aft and with full scantling poop, bridge, and forecastle decks of steel.

The holds will be divided by two oil-tight longitudinal bulkheads, continuous from the engine room bulkhead to the forward bulkhead of the forward pump room; and by transverse oil-tight bulkheads to form eight center tanks, eight starboard wing tanks, eight port wing tanks, a forward cargo pumproom and a midships cargo pumproom.

Hulls are arranged for single screw propulsion, driven by geared steam turbines, for which steam will be supplied by watertube boilers.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hulls Nos. 1237 and 1238, two steel hulls for towboats 169′ x 34′ 6″ x 7′ 2″ of 1540 gross tons.

Hulls Nos. 1240-1243, incl., 4 covered cargo barges 132 x 35 x 11 for stock, of 2072 gross tons.

Hulls Nos. 1244-1245—two welded towboat hulls 145′ x 32′ x 6′4″ for Pittsburgh Coal Co., of 600 gross tons.

Hulls Nos. 1246-1255, inclusive; 10

(Continued on Page 102)

A BIG LITTLE TOWING LAUNCH

Built by Tregoning Boat Company, Seattle, at a cost of $19,000.00, for the U. S. Reclamation Service, towing launch St. Thomas for Boulder Lake (42 feet long by 12 feet beam), was finished and had her trial trip on Puget Sound, after which she was hoisted onto a flat car and shipped to Boulder Dam. Her keel is of Bagac, frame of oak, planking of Philippine mahogany, deck and house of fir and cedar.

She has a 6-cylinder Buda diesel; a 3 to 1 Morse reduction gear; 38-inch diameter by 32-inch pitch propeller; a two-inch Fairbanks Morse centrifugal fire, bilge, and circulating pump, driven by belt from main engine; a 16-cell, 32-volt Exide battery served by an Enberg 1 kilowatt belt driven from main engine; a No. 50 Lux remote-control fire extinguishing system; a galley equipped with three-burner stove and Electrolux refrigerator, both operated on Flamo gas; and sleeping accommodations for four persons.

Mare Island Launches New Destroyer

On February 20 Uncle Sam's new 1500-ton destroyer, the U.S.S. Smith, slid down the ways at the Mare Island Navy Yard at Vallejo, California.

The Smith, the 17th destroyer and 82nd ship built at the Mare Island yard, is the second vessel of the United States Navy named in honor of Lieutenant Joseph Bryant Smith (U. S. N. 1841-1862). The new destroyer has an overall length of 334 feet, a beam of 35 feet and a draft of 10 feet. She will carry five 5-inch guns, several batteries of 21-inch torpedo tubes and will feature the latest in minelaying facilities.

The launching marked the high light of a morning replete with ceremonies in honor of the navy's newest contribution to modern warfare.

At 8:00 A.M. the Smith dressed ship and was flying bunting from every shroud when the admiral's salute for the arrival of Rear-Admiral Edward H. Campbell, commandant 12th Naval District, was fired. General Paul B. Malone, commanding officer 9th Corps Area, and other ranking officers of the army and navy arrived on the launch with Rear-Admiral Campbell.

Mayor Fred Haegler expressed the compliments of the people of Vallejo "A good job, well done!" His address included a short history of the navy yard and some of the work done there.

Mrs. Yancey Williams was official sponsor. Rear Admiral Williams, Commandant of Mare Island, gave a review of the military career of Lieutenant Smith, after whom the ship was named.

Following a short history and statistical report of the vessel, a bugler sounded "Attention" and the band struck up "The Star-Spangled Banner." "The Prayer for Our Navy" was given by Chaplain E. H. Groth, after which Rear Admiral Campbell and Major General Malone expressed the good wishes of their respective branches of the service.

At 11 o'clock Rear Admiral Williams gave the command, "Let go." With the traditional "I christen thee —SMITH," Mrs. Williams broke a bottle of champagne over the bow and the new destroyer slid into the water.

Due to electrically welded plates saving tons of rivets, the light ship barely moved the first pile of drag chains.

Progress of Construction

(Continued from Page 101)

welded coal barges 175′ x 26′ x 10′8″ for stock of 4720 gross tons.

Hull No. 1256, welded steel towboat hull, 90′x22′x5′ for M & O Dredging Co.; Pittsburgh, Pa.; 135 gross tons.

Hulls Nos. 1257-1261, inclusive; five welded W-2 coal barges; 175′x26′x 10′8″; of 2360 gross tons.

Hulls Nos. 1262-1265 inclusive; four welded flush deck cargo box barges, 100′x26′x6′6″; 660 gross tons.

Hull No. 1267, 1 steel coal barge 130′x34′x4′3″ for Pennsylvania Railroad Company, 530 gross tons.

Hull No. 1268, 1 steel hull for towboat, 173′x34′6″x7′2″ for John W. Hubbard, Pittsburgh, Pa.; 770 gross tons.

This makes a total of 31 hulls under contract, with a total gross tonnage of 13,478.

ELECTRIC BOAT CO.
Groton, Conn.

NEW CONSTRUCTION: Hull No. 19, **fleet submarine, Shark, (SS174)**: L.B.P. 298′; beam,, 25′; standard displacement, 1315 tons; keel laid, October 24, 1933; launched May 21, 1935; delivery, Jan. 1936.

Hull No. 20, **Tarpon (SS175)**: L.B.P. 298′; beam, 25′; standard displacement, 1315 tons; keel laid, Dec. 22, 1933; launched September 4, 1935; possible delivery, Feb. 1936.

Hull No. 23, **Perch**, S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; estimated launching, May, 1936.

Hull No. 24, **Pickerel, S.S. 177** keel laid March 25, 1935; estimated launching, June, 1936.

Hull No. 25, **Permit**, S.S. 178, keel laid June 6, 1935; estimated launching, August 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser** and **DD369 Reid** for the U. S. Navy, estimated completion dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington**; keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937.

Order placed for three 1500-ton destroyers; **DD397, DD398 and DD399**; no dates set.

MARIETTA MANUFACTURING CO.
Point Pleasant, West Virginia

NEW CONSTRUCTION: **One Steel Hull Anchor Barge, Hull Size 60′ x 22′ x 4′**—with steel A frame, deckhouse, and machinery. To be built under contract with the U. S. Engineers Office at Vicksburg, Miss., and to be delivered at Vicksburg, Miss., in 90 days, contract price $10,200.00. One pipe line dredge for U.S. Engineer's Office, Louisville, Kentucky. Completed and delivered.

One steel barge, 140′ x 34′ x 10′, of 6000 barrels capacity, for the Ashland Refining Co., Ashland, Ky.

Ten standard steel coal barges, 175′ x 26′ x 11′ for stock.

Three all-welded steel oil barges, 150′x30′x7′ for export.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359 aircraft carrier CV5, Yorktown**, for U. S. Navy; keel laid May 21, 1934; estimated delivery, October 3, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; estimated delivery February 3, 1937.

H361, light cruiser, CL47, Boise, keel laid Apr. 1, 1935; estimated delivery, August 22, 1937.

H362, light cruiser CL49, St. Louis; no dates set.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356)**, launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357)**; **Hull No. 410, McDougal (DD358)**; **Hull No. 411, Winslow (DD359)**; of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43), and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge**, Feb., 1936; **DD358, McDougal**, Apr., 1936; **DD359, Winslow**, June, 1936; **CL42, Savannah**, Aug., 1936; **CL43, Nashville**, Dec. 1936; and **CL46 Phoenix**, August 1937.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 1063, Nantucket Lightship No. 112,** building for U.S. Dept. of Commerce—Bureau of Lighthouses; L.B.P. 121′-6″, beam 31′, loaded draft 13′, compound engine, 600 i.h.p., 2 watertube boilers, pressure 165 pounds, keel laid July 17, no further dates set.

SUN SHIPBUILDING COMPANY
Chester, Pa.

NEW CONSTRUCTION: **Hull No. 151 Meadville,** ferryboat for Erie Railroad Co.; L.B.P. 234′; beam, 45′; loaded draft, 18′3″; speed loaded 12-13 m.p.h.; 1700 i.h.p. Skinner Uniflow engine; 2 watertube boilers; keel laid June 10, 1935; estimated launching, Jan. 10, 1936; estimated delivery, Jan. 26, 1936.

Hull No. 152—steel, twin screw, truck automobile and passenger steamer for Virginia Ferry Corporation. Length 260 ft., beam 59 ft., depth 19 ft. 1 in. 2 4-cylinder Skinner Unaflow engines—each 1400 S.H.P. 2 Foster Wheeler Water Tube boilers, cross drum sectional header type 285 pounds pressure. Estimated date of keel laying Oct. 15; launching March 14; delivery March 31, 1936.

Hulls No. 153-154—steam, single screw, steel oil tankers for Gulf Refining Company. Length between perpendiculars 425 ft., beam moulded 64 ft., depth moulded to upper deck 34 ft., loaded draft 27 ft. 6 in. Each vessel: 1 2800 S.H.P. Westinghouse cross compound double reduction geared turbine unit; 2 Foster Wheeler type A 3 drum boilers—400 pounds pressure. Estimated dates for No. 153. Keel laying Nov. 15; launching Apr. 27, 1936; delivery May 20, 1936. Estimated dates for No. 154: Keel laying November 30; launching June 15, 1936; delivery July 6, 1936.

Hulls No. 155-156. Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485′6″x68′0″x37′0″; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; launching Sept. 19, 1936; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

TREADWELL CONSTRUCTION COMPANY
Midland and Erie, Pa.

NEW CONSTRUCTION: **six barges,** 100′x26′x6′6″, for Treadwell Construction Company.

One barge, 100′x24′x8′ for Parsons & Rader. Completed.

24 Barges 175′ x 26′ x 11′ for Marion Steam Shovel Co., Marion, Ohio, 21 delivered.

2 Oil Barges 195′ x 35′ x 9′6″ for Campbell Transportation Co., Pittsburgh, Pa., one delivered.

2 15-ton whirler derrick boats—85-foot boom for U. S. Engineers, Huntington, W. Va.

1 Derrick boat for U.S. Engineers at Vicksburg, Miss.

10 Coal Barges, 175′x26′x11′, for Pittsburgh Coal Co.

UNITED DRYDOCKS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION:

DD364, Destroyer Mahan, keel laid June 12, 1934; launched October 15, 1935; estimated completion, April 15, 1936.

DD365, Destroyer Cummings, L.B.P. 334′; beam 35′; mean draft 10′10″; keel laid June 26, 1934; launched Dec. 11, 1935; delivery indefinite.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; estimated delivery, June 9, 1936.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; estimated delivery, August 9, 1936.

UNITED STATES NAVY YARD
Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case,** L.B.P. 334′; beam 35′; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, July 1936.

Destroyer DD371, Conyngham, L.B.P. 334′; beam 35′; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, Oct. 1936.

DD389 Mugford and DD390 Ralph Talbot, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May, 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD
Charleston, S.C.

NEW CONSTRUCTION: **U.S.S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; estimated launching Feb. 25, 1936; estimated completion date, June 1, 1936.

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; estimated launching Aug. 1936; estimated completion, Jan. 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser. L.B.P. 600′; beam 61′8″; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, April, 1936; estimated delivery, Dec., 1936.

CL 48, **Honolulu,** light cruiser; L.B.P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January 1937; estimated delivery October 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers.

PG. 50, **Erie,** gunboat; L.B.P., 308′; beam, 41″; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; estimated launching, January 29, 1936; estimated delivery, May 1, 1936.

CG 69 and CG 70, **Alexander Hamilton** and **John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308′; beam 41′; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS 172, Porpoise; keel laid, October 27, 1933;** launched June 20, 1935; estimated delivery, Feb. 1936; **SS 173, Pike, keel** laid, Dec. 20, 1933; launched Sept. 12, 1935; estimated delivery, May, 1936. **SS 179 Plunger,** keel laid July 17, 1935, estimated delivery Feb., 1937; **SS 180 Pollack,** estimated delivery, May, 1937; L.B.P. 289′0″; beam 24′ 11-1/16″; loaded draft 13-9″; diesel electric engines.

Two 1400-ton submarines, SS185 Snapper and SS186 Sturgeon, order received from Navy Department; September, 1935.

UNITED STATES NAVY YARD
Portsmouth, Va.

NEW CONSTRUCTION: Torpedo Boat Destroyer **Tucker (DD374)** for U.S. Navy, 341 ft. long; beam 35′; loaded draft, 10′10″; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, February, 1936.

Torpedo Boat Destroyer **Downes (DD375)** for U.S. Navy, 344 ft. long; beam 35′; loaded draft, 10′10″; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, May, 1936. Laying down lines under way in mold loft.

Torpedo Boat Destroyer **Bagley (DD386)** for U.S. Navy; keel laid Aug. 31, 1935; estimated completion November 1, 1936.

Torpedo Boat Destroyer **Blue (DD-387)** for U.S. Navy; keel laid, Sept. 25, 1935; estimated completion, Feb. 1, 1937.

Torpedo Boat Destroyer **Helm (DD-388)**; keel laid Sept. 25, 1935; estimated completion, May 1, 1937.

Order placed for **DD405** and **DD406,** two 1500 ton destroyers; no dates set.

Trade Announcements and Trade Literature

Seamless Alloy Tubes. The Babcock & Wilcox Tube Company, Beaver Falls, Pa., announces the commercial production of seamless tubes and pipe of a highly alloyed steel containing 25 per cent chromium and 20 per cent nickel. These products are available hot-finished in sizes up to 6 inches outside diameter and cold-drawn in smaller sizes. The company has been closely identified with the development of alloy-steel tubular products for severe service requirements and extends its range of analyses with this new alloy, which is being marketed under the trade name B&W Croloy 25-20.

This alloy has a high degree of oxidation resistance and is suitable for continuous operation at temperatures up to approximately 2100 degrees Fahrenheit. It is a ductile material possessing greater creep strength and resistance to oxidation at high temperatures than is possessed by alloys now commercially available in the form of seamless tubing. Its properties are such that the alloy will undoubtedly find a field of usefulness in high-temperature cracking, polymerization and other refinery operations, as well as for high-temperature equipment such as recuperators, thermocouple protection tubes, valves, and heat-resistant tubular members.

This alloy has been available for high - temperature application in sheet, plate, rods, and castings, but has not, heretofore, been made available in seamless tube form except through a tedious forging and boring process.

Los Angeles Orders Big Pumps. The award of a contract to the Worthington Pump and Machinery Corporation for six big centrifugal pumping units of 12,000 horsepower each for the Metropolitan Water District, Los Angeles, has recently been announced. These six pumps totaling 72,000 horsepower are identical, each for a capacity of 90,000 gallons per minute against a total head of 460 feet, the high mark in pump application for this service, and the largest award made.

These pumping units will be built at Worthington's Harrison, New Jersey, Works.

Other awards on this Metropolitan Water District job are for six 8,000 horsepower units to the Byron Jackson Company of Berkeley, California, and three 5,000 horsepower units to the Allis-Chalmers Manufacturing Company of Milwaukee.

Book Reviews

ELEMENTS OF DIESEL ENGINEERING. By Orville Adams, Consulting Diesel Engineer, Author of Modern Diesel Engine Practice. 478 (6x9) Pages — 284 Illustrations. Published by the Norman W. Henley Publishing Company. Price $4.00.

The increasing use of the diesel engine in the automotive, industrial, marine, agricultural and locomotive fields will so greatly augment its scope that thousands of trained diesel operators and repairmen will be needed during the next few years just to care for normal expansion.

This new manual is written in simple language and copiously illustrated with numerous helpful graphic charts and lettered sectional and phantom drawings of all types of engines and their parts. Every basic fact necessary to a complete understanding of the elements of diesel construction and operation seems to be explained, analyzed and briefed for easy assimilation by readers of ordinary mechanical ability.

The book contains twenty chapters, beginning with a discussion of standard definitions.

Considerable space is devoted to the development of high speed automotive diesels, both in Europe and America and a grouping of chapters on operation and maintenance of the engine and its auxiliaries is practically another book in amount of text matter.

The engineering student will appreciate the numerous drawings of engines and parts with everything in correct proportion. The student, as well as the diesel instructor will find the Questions and Answers for review at the end of each chapter valuable for examination purposes.

We do not hesitate to recommend this manual to all who are interested in the principles and elements of diesel engineering and their practical application to industry and to transportation afloat, ashore, and in the air. This is a new up to the minute treatise just off the press. It will be sent postage prepaid to any reader on receipt of price. Address Editor Pacific Marine Review, 500 Sansome Street, San Francisco, Calif.

Kempe's Engineer's Year - Book, 1936. 2668 pages with numerous drawings, tables and diagrams handsomely bound in red with gold stampings, published by Morgan Brothers, Ltd., 28, Essex Street, Strand, London, W.C. 2. at 31/6d. net.

This is the 42nd annual edition of a reference book which deals with all phases of modern engineering practice, and which is extensively used in all branches of the industry. The book has again been carefully checked and revised and a considerable amount of new material has been added, including an entirely new section dealing with Acoustics, Vibration and Noise—subjects of increasing importance to all engineers. Important additions have also been made to the sections dealing with Steam and Electrical Engineering.

The Trade Descriptive Sections have once more been extended, and contain full particulars of various products of a number of engineering firms.

Lake Shipping Gains

Port authorities in Toledo are looking ahead expectantly to a big 1936 navigation season, on the basis of important shipping gains there in the past year.

During the 1935 navigation season, there were 3,495 vessel departures from the port of Toledo. Lake shipments of coal and oil and incoming cargoes of ore and grain increased 20 per cent last year. Seventy-three large lake vessels are moored in the Toledo harbor for the winter, the second largest winter fleet on the Great Lakes. The Toledo Shipbuilding Co. reports more work on hand than it has had in the five winters past.

Observations *From The* Crow's Nest

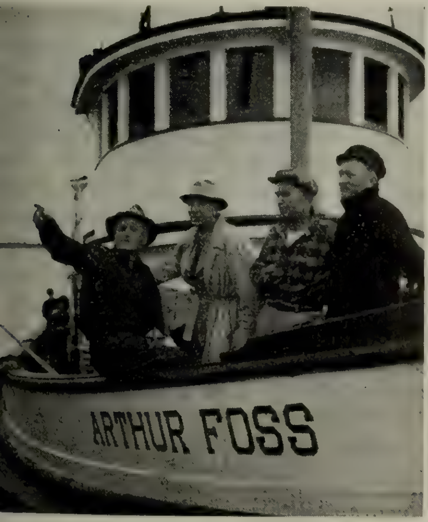
"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

The Commodore Goes Hollywood!

Millions of movie fans all over the world have seen the "Narcissus," the stout little vessel on which Marie Dressler turned in her last and perhaps her greatest performance — "Tugboat Annie," but it is doubtful if a single person recognized the famous tug as she churned her chunky way into Los Angeles Harbor on February 18, towing the much larger, and equally famous schooner "Commodore." It was the "Arthur Foss" actually that towed her big sister with a million and a half board feet of lumber all the way from Puget Sound to Los Angeles, but the "Narcissus" was merely the "Arthur Foss" playing her first role in the movies.

Despite her comparative smallness, this ship is probably the largest diesel driven tug on the Pacific Coast. She is owned by the Foss Launch and Tug Co., Inc., of Tacoma, Washington, and her latest feat is a fine measure of her prowess. For seven days and nights she buffeted the waves of the Pacific, and according to Captain W. F. Sporman, they were none too gentle during the voyage, but powered with Union Diesol and lubricated with propane-solvent refined Triton, her propellers hardly missed a turn during the trip.

The schooner Commodore and the tug Arthur Foss at anchor in Wilmington . . . at the completion of voyage from Tacoma.



Left to right: Captain W. F. Sporman of the tug Arthur Foss; A. C. Penberthy, Tacoma Lumber Sales Agency, Los Angeles; Captain John Wahlborg of the schooner Commodore; Al Carlsen, chief officer on the Arthur Foss.

The schooner Commodore is an old four master that used to be engaged in the lumber business between Seattle and Honolulu, and she figured in a historic race from Honolulu to the home port that ended on Christmas Day 1927. A five-masted schooner, the Vigilant, commanded by Matt Peasley, the hero of Peter B. Kyne's immortal Cappy Ricks stories, was traveling the same route at the time, and it happened that they both left Honolulu on December 7 bound for Seattle. Their respective captains were exceedingly anxious to get home by Christmas, and while no challenge had been issued, the voyage to Seattle developed into a contest in which the entire nation became interested. It ended on Christmas day with the Vigilant leading by thirty nautical miles. The present master of the Commodore, Captain John Wahlborg, was mate on the vessel at the time of the race.

There is every possibility that following the success of this trip, the Commodore will continue in coastwise service. Her rigging is still in good shape, and sails were set for two days on the way down to take advantage of favorable winds.

The Propeller Club of California

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JOSEPH J. GEARY

Secretary-Treasurer
STANLEY E. ALLEN

Headquarters
320 Market Street, Room 249,
San Francisco

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● Luncheon Meetings

February 4. Guest speaker Kenneth A. Kennedy, executive of the San Francisco division of Pan-American Airways gave a very interesting talk on the development of commercial flying—tracing the progress of his own company in establishing various routes from the United States to South America—and now to the trans-Pacific chain of islands.

The movie "short" was splendid and in every respect the program measured up to the club's high standard. Speaker Kennedy was introduced by W. Edgar Martin, chairman of the day. "Eddie" told us that he and "K.A.K." were schoolmates, played on the same baseball nine.

There was a good turn out showing the local interest in the company which operates the giant Clippers from San Francisco Bay across the Pacific.

February 18. "Fire Prevention and Fire Fighting Aboard Ship" was the topic presented by Battalion Chief George Murray of the San Francisco Fire Department. Chief Murray said: "I'd rather be out fighting fires right now than to be standing here making a speech. I'm not a speaker!"

But nevertheless — a darn good speaker he was—and is! (We heard many a complimentary remark after the luncheon.)

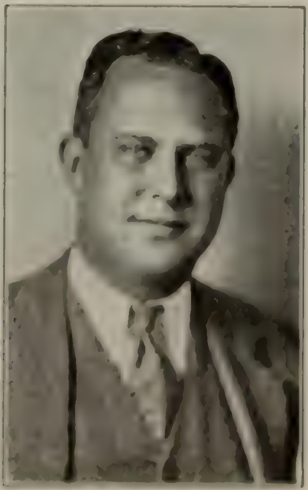
The subject of the talk is naturally interesting to maritime men and the speaker's audience came away with a feeling of confidence and of respect for the fine work the department is accomplishing safe-guarding waterfront property.

Demonstrations of First Aid, Life-Saving Procedures and other fire-fighting methods perfected here in San Francisco were conducted by several "fire laddies" and their captain. Chairman of the day was James L. Vizzard, member of the Program Committee.

March 3. Inland Waterways Corporation presented the movie-tone film showing the developments of the transportation company's system in the Mississippi Valley.

Garrett S. Wilkins was our honored guest sponsoring the showing.

The film came up to advance billing and proved unusually interesting. Edward H. Harms, our Board of Governors Chairman, introduced the program.



Herman D. Nichols sent us a pretty post card from Hilo—then raced it back to San Francisco — and came in a close second.

Spreading the gospel of Tubbs Rope in the territory of Hawaii, Mr. Nichols visited many of his friends in and around the Islands inviting them to come over to the mainland this year.

The Tubbs executive returned to San Francisco during the latter part of February and reported a very enjoyable ocean crossing.

Erik Krag, vice-president and general manager of Interocean Steamship Corporation, has released the following announcement:

"In accordance with cable advices just received from the "K" Line (Kawasaki Kisen Kaisha) head office in Kobe, these operators are inaugurating a new service from Japan to San Francisco and Los Angeles, and then to Mexico and Central America, Canal Zone and principal ports of West Coast South America as far as Valparaiso and Talcahuano, Chile.

The service will be on a monthly basis and will commence with the sailing of the Oregon Maru from Yokohama May 6th, from San Francisco May 24th, and from Los Angeles May 27th, followed by the Norway Maru, Cuba Maru, Florida Maru, and Wales Maru, this giving the service five vessels from the start and subject to further developments as the trade demands.

The Interocean Steamship Corporation have been appointed general agents for the combined California-South America and California-Orient services.

Agents are being appointed in the various ports of call.

●THE QUEEN MARY PREPARES FOR FIRST CROSSING

The new British super-liner Queen Mary, during the next thirty days will leave the shipyards at Clydebank, Scotland, and proceed to drydock in Southampton preparatory to speed trials, it was announced today.

With many of the preliminary tests already completed and workmen laboring day and night to put the finishing touches to her mammoth hull, the new ship is expected to made her maiden transatlantic voyage on May 27. It is believed that nothing afloat will exceed in size, power and efficiency the propelling machinery of the Queen Mary. Although actual figures have not yet been revealed, it is expected that the power of the machinery may be in excess of 200,000 horsepower.

America will play a part in the successful operation of the Queen Mary, for the huge ship will be lubricated with Gargoyle Marine Oil made by Socony-Vacuum.

The ship will give an impressive appearance of strength, power and speed. The structure of the ship comprises twelve decks, and to insure the utmost in safety, the hull is divided into 160 watertight compartments.

The ship will accommodate 2,100 passengers, not an unusually large number, considering the size of the vessel. Cunard-White Star officials have announced that the effort is being made to provide outstanding spaciousness with ample quarters for all classes of passengers.

Speed trials for the Queen Mary are expected to begin late in April. Because of the possibility that the bow wave of the huge ship might swamp yachts and damage waterfront dwellings during the special maneuvers, her speed tests will not be held over the usual measured course off the Ayrshire Coast, but instead will be carried out further at sea.

The Queen Mary will speed over her trial course at least twenty-five times, and the tests will be conducted in complete secrecy. Only Sir Edgar Britten, commander of the ship, will know what the results have been, and all communications will be carried on in code.

From executive offices of McCormick we learn because of the substantial increase in business handled at the port of Seattle, the McCormick Steamship Company will occupy a new terminal at that city within ninety days.

A new large pier to cost $275,000 is being constructed for this purpose by the Pacific Coast Company on the site of Pier B at the foot of Washington Street. The new structure will be situated in the heart of the wholesale district, will be 232 feet wide, 700 feet long, and have a covered area of over 117,000 square feet, an increase of more than 50 per cent over McCormick Steamship Company's present terminal facilities at the port of Seattle.

The new pier which will be sufficiently long to accommodate the largest ships entering Puget Sound will be modern in every detail. Direct rail connections and tailgate delivery will be provided.

In connection with this construction the Pacific Coast Company have announced that they intend to improve other property adjacent to this area with the ultimate intention of building up a vast transportation and shipping center which will include offices as well as docks, warehouses, and railroad facilities.

●RAY BURLEY IS ADVANCED.

Charles L. Wheeler, executive vice-president of McCormick Steamship Company, 461 Market Street, San Francisco, California, announces: effective February 11, Mr. Ramond F. Burley, Freight Traffic Manager, San Francisco, California, will assume the duties of Mr. Joseph C. Strittmatter, resigned.

Mr. A. P. Leatherbury, Atlantic Coast Manager for the Chas. R. McCormick Lumber Company, arrived in San Francisco Friday, February 28, on his way back to New York.

Mr. Leatherbury has recently been in the Northwest where he visited the company's mills and conferred with some of the company's officials.

●McCORMICK PERSONNEL

The following changes in the shore personnel of the McCormick Steamship Company were announced during the month by Charles L. Wheeler, vice-president of that organization:

George P. Pell, former general agent at Oakland to assume the duties of assistant freight traffic manager at San Francisco;

George Bushnell, owner's representative at Vancouver, B.C., to succeed Mr. Pell as general agent at Oakland;

Folger Athearn, former general passenger agent in San Francisco, to succeed Mr. Bushnell at Vancouver, B.C.;

William Neill, former district freight agent at Oakland, to become general freight agent there;

William N. Eigle, formerly general freight agent at San Francisco, to act as district manager at Los Angeles, pending recovery of John L. Hook, Jr.;

Thomas Low, former district freight agent at Stockton to be general agent at that city; and

John A. Stein of the San Francisco traffic department to assume Mr. Eigle's duties in San Francisco, while Eigle is in Los Angeles.

Mr. Colin Thompson, Manager, McCormick Steamship Company, Buenos Aires, arrived in San Francisco Monday, February 24, to confer with officials of the company for a few weeks.

Mr. Thompson has spent many years in the Argentine and has recently visited all the countries on the East and North Coast of South America and is completely familiar with economic conditions and the trade possibilities of the following countries:

Argentina
Brazil
Uruguay
Colombia
Venezuela
Trinidad

Mr. Thompson would welcome the opportunity of discussing trade prospects between the Pacific Coast and South America and any one interested is cordially invited to make an appointment with him. He can be reached at the head office of the McCormick Steamship Company, 461 Market Street, San Francisco.

● A. J. McCARTHY ELEVATED TO IMPORTANT I.M.M. POST.

At a meeting of the board of directors of the International Mercantile Marine Company, February 11, at One Broadway, New York, **A. J. McCarthy**, general manager of the organization, was elected a vice president. Mr. McCarthy succeeds **John M. Franklin** who was elected president of the company by vote of the board of directors on January 30 to succeed **P. A. S. Franklin**, elected chairman of the board at the same meeting. In his new position, Mr. McCarthy will be in charge of operations.

Mr. McCarthy's elevation to this important post in an outstanding American shipping company follows 38 years of service with the organization which began when he joined the staff of the Leyland Line in Portland, Maine, as manager in 1898. Subsequently he was transferred to Montreal, and following that to Quebec and Boston.

After the Leyland Line became a part of the newly organized International Mercantile Marine Company, Mr. McCarthy was appointed assistant manager in Boston for the associated lines.

In 1917, he joined the operating staff of the International Mercantile Marine Company at New York. This promotion marked the beginning of a period of notable service as representative of the company attached to the special patrol board of the United States Navy, in connection with the purchasing and outfitting of many vessels engaged in war activities.

In 1931, Mr. McCarthy was made general manager of the I.M.M. Company, in charge of the operation of all of its ships and terminals. In the following year, when the International Mercantile Marine and Roosevelt Steamship Companies were merged, Mr. McCarthy's duties were extended to include general supervision of the several lines owned or operated by the combined companies, notably the United States, American Merchant and Baltimore Mail Lines in the transatlantic field, the Panama Pacific Line in the intercoastal run, and the American Pioneer Line serving Australia, India and the Orient.

A. J. McCarthy.

Mr. McCarthy represents his organization in the American Steamship Owners' Association and is a member of the executive committee of that association. Last year he was elected chairman of the New York Shipping Association. He is also a member of the Executive Committee and chairman of the Committee on Operation of Marine Terminals of the National Fire Protection Association.

V. A. Driscoll, formerly district freight manager for General Steamship Corporation, has been appointed manager at Portland, to succeed **J. C. Settle**, who resigned to open a steamship brokerage agency. **W. C. Olin**, formerly of the Seattle office, has been transferred to Portland.

E. F. R. De Lanoy, Pacific Coast manager of Holland-America Line, sends us this announcement:

Arriving from the Hawaiian Islands in San Francisco on Friday morning, March 6th, and remaining in port for two days, will be the S.S. Atlantis, Royal Mail Cruising steamer, with a large number of passengers from England.

This is the first time that a large cruising steamer of the Royal Mail Lines, Ltd., has arrived in San Francisco, although this company is well known here on account of its joint service with the Holland - America Line from Pacific Coast ports to Europe.

Various shore excursions have been arranged for the passengers, arrangements of which are in the hands of Thos. Cook & Sons Wagons-Lits, Inc.

Necrology

## ● HARRY C. PROCTER

The chief steward of a passenger liner is perhaps more closely associated with the lives of the passengers aboard ship than any other officer. To be successful he must combine the qualities of a statesman, a diplomat, and a general. Such a one was **Harry C. Proctor**, who passed away in the Marine Hospital at Seattle, January 1, 1936, after twenty-five years as a chief steward on the ships of the Pacific Steamship Company and the Dollar Lines. Known to thousands of travelers and marine men in all the ports of the Pacific Ocean, Harry Proctor was one of the most popular seafarers on the Pacific coast. He was chief steward on the H. F. Alexander for the entire time that that vessel served the California-Puget Sound trade.

Following a public funeral service, his body was cremated and the ashes strewn on the Pacific off Cape Flattery, from the bridge of the American Mail liner, President McKinley.

● WILLIAM B. HAMILTON

William B. Hamilton, collector of customs at San Francisco for 13 years and 43 years a member of the customs service, died during the month. He started his sea service in the era of sailing ship days. He became cashier of customs in 1897, and collector of customs under the late President Harding, being re-appointed by former Presidents Coolidge and Hoover.

● FINLAY M. DRUMMOND

It is with profound grief that we learn of the passing of Finlay M. Drummond, president and manager of the Ingle Manufacturing Company of San Diego. He was well known in merchant marine and naval circles through the work of his firm in shipboard installations.

He was a man of sterling qualities in business and social life, and his death will be mourned by many friends.

John M. Franklin Succeeds Father as I.M.M. President

The above illustration shows H. E. Kemp, supervisor of marine operations for Union Oil Company, reading the tape as it ticks from the teletype machine. This latter is an important feature in Union's marine transportation system, and keeps the marine department in direct connection with Mackay Radio for the immediate dispatch or receipt of short wave radio messages. Thus vessels at sea, marine terminals, and ports of call may be contacted with the least possible delay.

Election of **John M. Franklin** as president of the International Mercantile Marine Company, to succeed his father, **P. A. S. Franklin,** who becomes chairman of the board of directors, has been announced.

There are few men in the shipping business who have had wider experience than has the elder Franklin. Since becoming president of the I.M.M. Company in 1916, he has been an international figure in the shipping world; for when he became the company's head the I.M.M., although owned by American capital and controlled through American management, had under its flag a number of foreign lines. This made it a target for attack by partisan critics, and through a succession of trying years, Mr. Franklin one by one disposed of the company's foreign flag tonnage. Securing control of the United States Lines, he reorganized that company into the important factor in American shipping it is today.

John Franklin has been connected with the I.M.M. from its merger with the Roosevelt Steamship Company in January, 1931. He has had the advantage of close association in the company's affairs through his father. Both father and son are big men, well over six feet tall; and big, too in their understanding of the problems of the American merchant marine, and world shipping. They are both engrossed in developing American shipping, and pulling together in the I.M.M. they should be a team hard to beat in the shipping world.

At the seventy-fourth annual meeting of the members of the American Bureau of Shipping held in New York in February, **J. Louis Luckenbach,** president, reported that on January 1, 1936 there were 89 vessels of 125,565 gross tons being built to American Bureau of Shipping classification, whereas on January 1, 1935 there were only 21 vessels of 25,635 gross tons. The increase is due, Luckenbach said, to the tanker tonnage for which contracts have recently been placed.

At a meeting early this month of the board of governors of the Pacific Coastwise conference, **John E. Cushing,** vice president of the American-Hawaiian Steamship Company was elected chairman. **W. R. Chamberlin,** president of W. R. Chamberlin & Company was elected vice president.

J. Louis Luckenbach was re-elected president for the fourth time of the American Bureau of Shipping, at their seventy-fourth annual meeting held in New York in February. **G. T. Taylor** was also re-elected vice president and treasurer, while **Frank Gair Macomber** became honorary vice president and **J. W. Cantillon,** secretary. Among the newly elected members to the board were **Roger D. Lapham; H. D. Collier,** vice president of the Standard Oil Company of California; **Charles Bethold,** vice president American West African Line; **J. E. Slater,** vice president Export Steamship Company; **George Dawe,** president Robin's Drydock and Repair Company; and **J. F. Matten,** president, New York Shipbuilding Company.

J. G. Euson, formerly Pacific Northwest manager at Seattle for the Luckenbach Steamship Company, has been transferred to San Francisco as assistant to general manager for that company. **M. J. Wright,** general manager, has been in ill health for some time, and the change has been brought about in order to relieve him of too much responsibility until he has had time for recuperation.

● R. P. Schwerin Passes

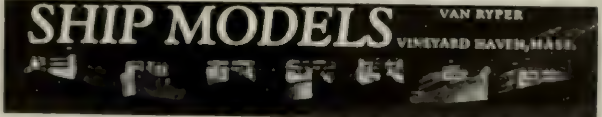
Rennie P. Schwerin, former vice-president and general manager of the **Pacific Mail Steamship Company,** who was the leading figure in trans-Pacific shipping before the World War, died during the month of January. Mr. Schwerin also served as vice-president and general manager of the Associated Oil Company and was for many years a dominant figure in the development of trans-Pacific radio communications.

Robert D. Pickett has been appointed district passenger agent for the States Lines at San Francisco, according to **L. E. Archer,** passenger traffic manager of the International Mercantile Marine, general agent for States Line. Pickett, who is 35 years old and a native of San Francisco has been serving the States line as purser of the General Pershing. For years he was purser of the Dollar liner President Van Buren, and he has an extensive knowledge of travel conditions in the Orient, which fits him for taking over the duties of booking Oriental business, which is part of his new position.

Kazuo Takahashi, new manager of the N.Y.K. Line at the San Francisco office, has taken over his duties here. S. Nakase, transferred to Kobe in December. Mr. Takahashi has been manager of the N.Y.K. New York offices for the past five years, before which he was manager of the Dairen office and assistant manager of the London office.

Eskil Berg, prominent retired engineer of the General Electric Company, died in January. Mr. Berg, who designed and installed the propulsion machinery on the Panama Pacific liners, Pennsylvania, Virginia, and California, was for some time an associate of the late Dr. Charles P Steinmetz; after which he became an associate of W.L.R. Emmet and was connected with work on the steam turbine, on the development of electric ship propulsion and on the mercury turbine.

James Kennedy, general manager of the marine department of the Gulf Refining Company, died in January at his New York home. Mr. Kennedy had been with the Gulf Refining Company for 28 years, directing the movement of the company's fleet of oil tankers.



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PACIFIC MARINE REVIEW

APRIL 1936

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PACIFIC MARINE REVIEW

APRIL, 1936
VOL. XXXIII NO. 4

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PACIFIC MARINE REVIEW

VOLUME XXXIII APRIL 1936 NUMBER 4

Editorial Comment »« »«

An Investment—Not a Subsidy

In all the pother at Washington between groups of legislators, Federal Departments, and powerful lobbies, we see emerging a number of so-called subsidy bills, and the usual group of die-hard middle-West senators sworn to prevent at any cost the passage of any of these measures; which seems to prove that any government aid to the merchant marine must be dubbed by some other name than "direct subsidy" in order to avoid the midwest opposition. If this be true, as seems to be proved by the history of all such measures during the past eighty years, then why not drop the word subsidy entirely and substitute some such term as equalizing investment?

If the Federal policy is established on the contention that 50 per cent of America's foreign trade should be carried in American ships, built in American shipyards, operated by American shipowners, and manned by American crews, as a wise policy for the nation, then the nation must absorb the cost differential on these American ships, or their American operators will be unable to operate.

This idea is stated with great clarity by Col. J. Munroe Johnson, assistant secretary of the Department of Commerce, in a speech at the annual dinner of the Propeller Club of the United States at Baltimore, on March 11, 1936. He said:

"When Government assistance is limited to equalizing the building and operating differentials between American and foreign ships, to bring the capital and operating costs to the level of the foreign ship, it should not be interpreted as a subsidy payment to either the shipbuilder or the shipowner. It merely enables the employment of American labor in the building of the ship and in its operation instead of the employment of foreign labor. The equalization of such costs by the Government, furthermore, provides uniform employment for American labor in the shipbuilding and shipping industry and the many allied American industries furnishing materials in the building and operation of ships from the raw state to manufactured products.

"The highly beneficial results achieved in enabling American labor to build and operate ships is not all the Government derives by its investment in equalizing building and operating costs. There are other factors of paramount importance benefiting the nation as a whole. For example, in the matter of national defense the Government has available, promptly, types of vessels suitable for conversion to naval and military use during a war or national emergency. In this respect alone the equalization cost is more than justified. However, from the commercial angle our exporters and importers are furnished with a dependable transportation system in essential foreign trade routes, which services are maintained with regularity and frequency and with types of ships capable of competing successfully in the transportation of American commerce, affording equal opportunity for the sale of American products in foreign markets.

"Now as to the cost to the Government in placing American ships on a parity with foreign vessels by equalizing the differential, that cost will amount to a fraction of one per cent of the value of our foreign trade.

"Of the value and volume of traffic available in the international carrying trade, the United States is the second largest contributor. America is entitled to carry a fair share of such commerce, and derive a fair proportion of the revenues, which total hundreds of millions of dollars annually. Here, again, equalization is justified by enabling American ships to obtain such revenues which add to a balance of trade in our favor and conserve our national wealth."

At the present time, a ship, built in an American shipyard, will cost from 50 to 75 per cent more than the same ship built in shipyards abroad; and under certain foreign registers that ship can be operated at much less cost than under American registry. No American citizen, however patriotic he may be, will invest his capital in American ships in the highly competitive foreign trade under such a heavy handicap. The federal government, however, representing the entire nation, may very properly take over the handicap as its part of the investment, because of the many direct benefits that come to the nation through:

1. The maintenaance of necessary American naval auxiliaries at minimum expense;

2. The maintenance of adequate shipping services under American control on the principal sea-trade routes of the world;
3. The furnishing of steady employment to a large group of skilled and unskilled American labor;
4. The maintenance, at least possible expense, of adequate ship-building and ship repair plants necessary in time of emergency;
5. The maintenance of a very considerable amount of taxable property values.

Surely all of these considerations justify federal aid to shipping as an investment rather than a subsidy.

Direct Subsidy Legislation

There are now before Congress five or more subsidy bills, and a declared threat that some 16 to 20 Senators under the leadership of Clark of Missouri will filibuster any one of them to death, should it come up for final action on the floor of the Senate. The Senate has eliminated funds for mail contract pay from the Treasury-Post Office Appropriation bill, so that for the year beginning July 1, 1936, carriage of mail by sea can be paid for only on a poundage basis, unless the Senate—failing to pass some direct subsidy bill—restores the postal contract funds by a deficiency appropriation.

The Subsidy Bill most likely to pass is S-3500, the revised and mutilated Copeland Bill. The following is an abstract of a statement thereon by the American Steamship Owners Association. This bill provides three forms of aid:

1—adjustment of existing mail contracts;
2—aid in construction of new ships; and
3—aid in the operation of ships in foreign trade.

In the adjustment of existing mail contracts, there is no basis provided for measuring their value, but the Maritime Authority would be limited by the mandates that no allowance shall be made for expected profit, and that—failing of satisfactory adjustment—all contracts shall be cancelled within one year after the passage of the bill. The shipowner party to the contract would, of course, have his constitutional right to sue for just compensation in the Court of Claims, but the bill pursues him even there by a prohibition of that court, from any inclusion of prospective profits in its award, and a specific provision that the United States has a right to urge as a valid defense against such a suit "collusion or fraud in obtaining the contract," or the "failure to award any such contract as the result of actual competitive bidding as required by the Merchant Marine Act of 1928." Since collusion or fraud is perfectly valid defense without this provision, and since the Merchant Marine Act of 1928 did not require "actual competitive bidding" it would appear that the Senate or the administration is here trying to create a special authorized defense for the United States which it could not possibly have under the existing law at the time these contracts were made.

Under operating subsidy provisions in this bill we find the same tendency to set limitations that will not only make the subsidy provided fall short of parity but will make the operation of the subsidized steamship company more expensive.

All shore expense is excluded from the comparative costs in calculating the necessary subsidy.

No subsidies will be granted any contractor who has any pecuniary interest in American domestic intercoastal or coastwise services without express permission of the Authority. Shipowners figure that this provision would at the discretion of the Authority, bar all but four or five of the American lines now in foreign service, and even these four or five might be technically disqualified.

No subsidy is to be paid, except in the case of direct parallel foreign flag competition, unless after public hearing the Authority shall determine such subsidy necessary to offset the competition of foreign flag indirect services, carrying substantially the same cargoes as the American line under consideration. This clause is very objectionable to American shipowners since it would throw their whole business open to inspection by foreign competitors.

No subsidy shall be granted to any contractor who directly or indirectly through corporate or individual connections has any pecuniary interest in providing stevedoring, docking, repairing, or supplying his own vessels in any domestic or foreign port, unless expressly permitted so to do by the Maritime Authority only after its being found at a public hearing to be in the public interest.

Under this provision, no American steamship company would be allowed to do its own stevedoring, run its own terminal, make its own repairs, move its own vessels with its own towboats, or move or stow its own cargo on or off its own wharves—unless it could prove to the Authority at a public hearing that it must perform these services for itself because such operation is necessary in the public interest. Then, having made such proof, and having obtained permission, if this company invests in the proper equipment and obligates itself on a terminal lease, the permission may be revoked or suspended at any time.

These provisions for adjustment of existing contracts are destructive rather than constructive, and would certainly not be helpful in the maintenance and upbuilding of the American merchant marine.

In subsidy for new construction, the revised Copeland bill sets as a limit 50 per cent of the total American cost of the vessel. In any specific case, the claim for such subsidy above 33-1/3 per cent and up to 40 per cent must be accompanied by conclusive evidence that the actual difference in cost of a similar ship in a foreign shipyard would be more than 33-1/3 per cent.

If, in any particular foreign trade route, the Maritime Authority adjudges the differential to be more than 40 per cent, it may allow additional, up to 50 per cent; but this additional subsidy shall not be granted until 30 days after the Authority has—while Congress is in session—submitted a report thereon to the Committee on Commerce of the Senate, and the House Committee on Merchant Marine and Fisheries.

Those who know shipbuilding and shipping conditions in America and abroad, know that a 50 per cent limit on shipbuilding subsidy will not in all cases give parity to the American shipowner in cargo vessel costs.

Pacific Marine Review Twenty-five Years Ago

Pacific Marine Review, the oldest marine publication on the Pacific Coast, published its April, 1911, issue at Seattle, Washington. This issue contained the first mention in our pages of a constantly recurring rumor which is still as alive today as it was then, and no nearer consummation—

"It has been reported in the daily press, and among many of our contemporaries, that negotiations have been practically completed for the purchase of the *Union Iron Works* in San Francisco by the United States government, upon the decision of the Secretary of the Navy, G. V. L. Meyer, that the Navy Department needs this property. The following telegram, which is self-explanatory, has been received at this office:

> 'Pacific Marine Review:—
>
> 'No negotiations for purchase of Union Iron Works have been completed, or even entered into by this department.
>
> G. V. L. Meyer,
> Secretary.' "

We reported: progress on "modern improvements" in wireless telegraphy; establishment of direct European service for Pacific coast ports by steamers of the *Harrison Line,* via Cape Horn; the completion at *Newport News* of the new Associated Oil Company tanker, *W. F. Herrin,* and her start 'round the Horn, towing a Standard Oil Company barge; the launching of the steel steamer, *Navajo,* at the *Craig* shipyard, Long Beach; the launching of the new Toyo Kisen Kaisha liner, *Shinyo Maru,* at Mitsubishi Dock Yards, Nagasaki; an extended tour of Atlantic coast cities by *A. F. Haines,* then general freight agent for Dodwell and Company, and stationed at Tacoma; and the appointment of *Harold H. Ebey,* as general agent for the Kosmos Line in California, Oregon, Washington, and British Columbia.

Notice was given of the program of the spring meeting of the Institution of Naval Architects at London on April 5 and 7. This program contained some very famous papers by noted men.

Safety at Sea

"A ship at sea is no safer than the discipline of its crew", declares Joseph B. Weaver, director of the Bureau of Navigation and Steamboat Inspection, and no man ever said a truer word. During recent months, there have been a number of instances where both seamen and firemen have refused to go on duty when the regular watch was called, and the captains have felt unable to proceed against the men because of fear of owners that their ships would be black-listed by the labor organizations involved.

Director Weaver, as a practical man, knows it is impossible to operate ships at sea successfully or safely under such conditions. Secretary Perkins of the Labor Department, on the other hand, declares that she can see no difference between a strike on a ship at sea and a strike in a factory on land. Quite a number of differences, which are invisible to Madam Secretary of Labor Perkins, seem perfectly evident to the ordinary man on the street.

The status of the crew aboard ship is one of peculiar privilege and responsibility. Each member of the crew of any ship is under the care of the federal government in a very privileged way. The shipowner or operator is responsible to the federal government for bringing each member of the crew to the port for which he signed on. Federal officials in all principal ports are charged with the care of sea-faring citizens. Federal hospitals are maintained to take care of sick merchant seamen of all grades.

All of these privileges bring a responsibility to stay by the ship and perform all normal and all necessary extraordinary duties pertaining to the class of enlistment. A refusal to perform such duties at sea is mutiny, and is punishable with appropriate penalties. Until quite recent times, the usual punishment was death.

Until wireless brought ships under home office control, the judgment of the captain was supreme at sea. The great majority of the old type shipmasters kept excellent discipline and dealt strict justice to the crew. Some, few, were monsters of cruelty, and their record seems to speak much louder than the firm kindness of the majority.

Not only were members of the crew disciplined in days gone by, but the passengers as well. In some of the recent disasters on American ships at sea, there has been almost complete loss of morale due to the drunken condition of large numbers of both passengers and crew. Perhaps we should return to the daily disciplinary inspection of passengers' quarters, when every passenger had to be out of his bed at a certain time in the morning unless authorized to stay there by a doctor's certificate.

No automatic equipment, however perfect, will take the place of a well-disciplined crew and competent officers in securing safety to passengers on shipboard in an emergency at sea.

J. J. MAGUIRE,
Manager, Marine Department, Socony Vacuum Oil Corporation.

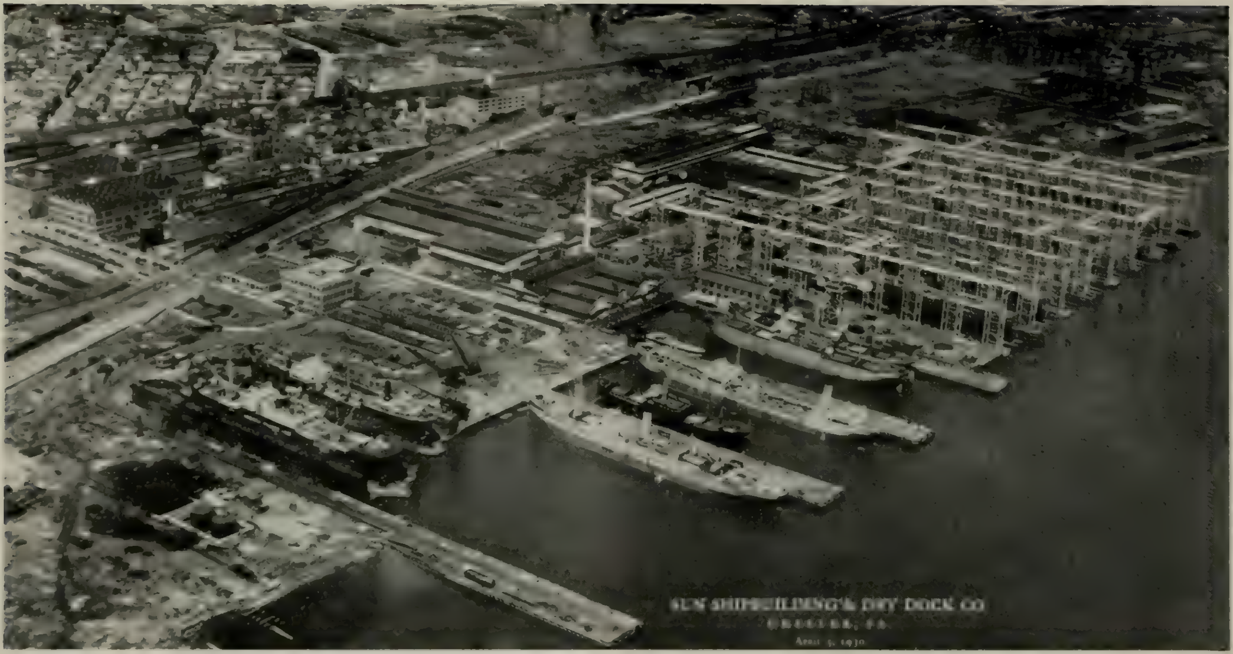
N. J. PLUYMERT,
Naval Architect, Socony Vacuum Oil Corporation.

EDWARD G. SEUBERT,
President, Standard Oil Company of Indiana.
Chairman, Pan-American Petroleum and Transport Company.

ROBERT E. WILSON,
Vice-Chairman, Pan-American Petroleum and Transport Company.

JOHN G. PEW,
President, Sun Shipbuilding and Dry Dock Company.

ROBERT HAIG,
Vice President, Sun Shipbuilding and Dry Dock Company.



Sun Shipbuilding Yard Builds Four Sister Tankers

Two for Socony-Vacuum Oil Company, Inc. and Two for Pan American Petroleum and Transport Company

The Sun Shipbuilding and Drydock Company occupies a commanding position in the American shipbuilding industry. At the present time, its ways are filled with commercial vessels including two passenger ferry steamers, seven large seagoing steam tankers, and one large seagoing motor tanker. The orders now in hand for new ship construction will keep the shipbuilding ways busy up to the middle of 1937, and other orders anticipated bid fair to keep this plant steadily employed for some years in the future.

The original company, known as the Sun Shipbuilding Company, was organized in the spring of 1916, and laid the foundation for the building of the present yard early in that year. It later purchased the famous old Robert Weatherill Engine Works located adjacent to the shipyard; and, at the same time, became incorporated as the Sun Shipbuilding and Drydock Company. The engine works purchased had for some fifty years been noted for the production of the famous Weatherill Corliss steam engine.

Covering an area of about 90 acres, with a river frontage of 2600 feet on the Delaware at the entrance to Philadelphia harbor, this plant occupies a very strategic location for ship repair work, and an almost historical location for shipbuilding work. The site is a few miles north of the location of the old John Roach plant, the first established iron and steel shipbuilding yard in the United States.

As the Sun shipyard was originally laid out, it included five shipbuilding ways, each capable of building ships up to 500 feet in length. Later, the number of ways was increased to eight, and provision was made for higher and longer ways. All shipbuilding ways are of concrete construction with permanent overhead structure carrying bridge cranes.

The yard layout is very carefully planned for railroad trackage and crane service and for the flow of steel and other material from the rails through the fabricating shops to the ways. Bridge cranes travel over the material storage yard, and locomotive crane service tracks throughout the yard and into all the docks. All roadways throughout the yard are of concrete construction and light materials are handled at high speed over these roads with electric trucks. Gantry cranes on piers serve the outfitting dock and a large hammerhead crane is provided for heavy lifts.

The yard is amply provided with large piers and wet basins averaging up to 600 feet in length.

All shops were planned in the proper relation to the shipbuilding ways so as to make a compact arrangement and at the same time facilitate the economic handling of all materials. The fabricating shop, the mold loft, and blacksmith shop are all under one roof, directly at the head of the building ways and closely adjacent thereto. These three important adjuncts to shipbuilding are so arranged that the fabricating shop feeds directly to the work on the ship ways. The building housing these three shops has an area of over seven acres of floor space under one roof. The arrangement and equipment of these shops provide what is probably the most modern and most efficient shipbuilding yard.

The principal shops of the plant, in addition to the three mentioned, are the anglesmith shop, coppersmith shop, boiler shop, machine shop, foundries, pattern shop, pipe shop, and electrical shop. All of these are kept equipped with the best in modern machinery for their particular uses, and throughout the whole plant all machinery is electrically operated and controlled.

During the past decade, there has been great development in electric welding. Sun Shipbuilding has kept well abreast of this development, and has carried on extensively in the welding art, having built several all-welded medium-sized oil tankers, and having now under construction one large oil tanker in which welded construction is carried to allowable limits.

In all of the shops where welding is employed, the latest equipment is available for examining welds by x-ray.

Several years ago the Sun Shipbuilding and Drydock Company, with keen appreciation of future needs, took over the American license to manufacture and sell the Doxford diesel oil engine, and the company today is the largest builder of marine diesel engines in America, having developed the Sun Doxford diesel engine along American marine lines. This engine has been an unqualified success and many installations are in operation in a large number of ships. Sun Doxford diesels are built in the same shops that for so many years furnished the finest steam engines to American users.

This yard has built many fine motor vessels, equipped with these engines. We illustrate herewith the motor tanker, Brilliant, which—with a sister ship, Daylight—was built in 1931 by the Sun Shipbuilding and Drydock Company to the order and from the plans of the former Standard Transportation Company (now the marine department of the Socony-Vacuum Oil Corporation). Each of these tankers has a deadweight capacity of 14,500 tons, and is propelled at a speed of 11 knots by one 4-cylinder, Sun Doxford diesel engine of 2800 brake horsepower.

On her maiden voyage, the tanker, Daylight, made a very remarkable record. She sailed from New York on the seventeenth day of November, 1931, on a voyage carrying her completely around the world, touching at Beaumont, Texas; Bombay, via Cape of Good Hope; Karachi; San Pedro; Colon; and New York—arriving back, April 4, 1932. During the voyage, she logged a total distance of 30,390 nautical miles in a running time of 123 days, 12 hours, 58 minutes; which figures an average sea speed of 10.25 knots. Her average daily fuel consumption was 11.55 tons. Her log shows that no time was lost at sea.

On the completion of this round-the-world voyage, the builders wired the owners asking what repairs would be needed. The reply was, "None."

In order to more fully utilize the capacities of this organization and these facilities, the company—after considerable research — added a department covering the manufacture of oil refining equipment, welded pressure vessels, and other large steel structures, heavy plate work fabrication, and special machinery. The building of oil tankers and the building of equipment for oil refineries are closely related activities, and Sun Shipbuilding and Dry Dock Company soon gained an enviable reputation with the oil refineries through this addition to its shipbuilding plant.

One of the very interesting additions in connection with this new department is the huge annealing furnace for heat treating large vessels and massive steel structures. Our illustration shows this enormous piece of equipment which is one of the largest of its kind in America. The furnace is gas fired and is automatically controlled at any predetermined temperature by a thermostat. In connection with the welding of high pressure vessels and other struc-

Sun built and Sun-Doxford engined motor tanker, Brilliant, sister ship to Daylight, whose wonderful non-stop record is described on this page.

tures, this furnace is of especial value.

The existence in the shipyard of a department equipped to take care of high pressure vessels is of considerable significance to shipbuilding itself, in that there are here assembled bending rolls, presses, and other machines of a capacity required in the fabrication of the very heavy plates used in high pressure work. In short, this shipyard is capable of handling within its own plant, the heaviest fabrication problems that would be encountered in any modern shipbuilding job.

● Four Sister Tankers

To this plant, early in the present year, came an order for four sister tankers. It is over five years since four sister ships have been built for the petroleum trade in America, and longer than that since an order for four sister ships for that trade has been placed in one yard. Two of these tankers are being built for Socony-Vacuum Oil Company, Inc.; the other two for the Pan-American Petroleum and Transport Company.

Pan - American Petroleum and Transport Company at one time built and operated one of the largest fleet of American tankers in existence. This fleet consisted of 31 vessels in addition to a fleet of tow boats and barges. They disposed of their fleet some few years ago in connection with the sale of their foreign properties, and the present four boats under construction are the start of a new and modern fleet of tankers to handle their rapidly growing business.

In external appearance, the vessels will be very similar to the tankers Socony Vacuum and Magnolia. They are of practically the same length and the same draft, but with increased beam and slightly larger deadweight carrying capacity and are built with twin longitudinal bulkheads through the cargo tanks. There are other considerable differences in the arrangement of the new tankers, and a greater electrification of the auxiliary machinery. There is more use of fire-resistant material and elimination of wood.

On account of these differences, and of the importance of the order, it is thought proper that there should be published a full description of these ships.

Huge annealing furnace at Sun Shipbuilding and Dry Dock Company Plant.

● General Characteristics of Hull

The principal dimensions are:

Length overall	501 ft., 7½ in.
Length—Lloyd's B.P.	485 ft., 6in.
Beam, molded	68 ft., 0 in.
Depth, molded (upper deck at side)	37 ft., 0 in.
Draft, molded designed	29 ft., 8-5/16 in.
Draft, total to bottom keel butt strap	29 ft., 10⅞ in.
Width of center tank	34 ft., 5 in.
Total deadweight capacity	15,400 tons
Block coefficient	0.757
Capacity cargo tanks	5,469,800 gals.
Sea service speed	13 knots

The hulls are being built on the Isherwood bracketless system to classification *100A1 American Bureau and Lloyd's and to comply with the rules of the United States Steamboat Inspection Service. Standard ship steel, riveted construction, is used, with iron rivets from the 6 foot waterline to keels in way of all oil-carrying compartments. Of single-deck type, with raised forecastle, bridge, and poop, with nicely raked stem, beautifully molded cruiser stern, and well raked masts and funnel, these ships will present a very attractive appearance. The hulls are divided into seventeen oil and water tight compartments by 16 transverse bulkheads.

The oil cargo tanks are further divided by two parallel longitudinal bulkheads, 34 feet, 5 inches apart so that each transverse cargo space is divided into three tanks.

From stem to stern, the transverse compartments contain: 1—fore-peak tank, boatswain's stores and chain locker; 2—reserve fuel oil tank and dry cargo space; 3—the forward pump room and cofferdam space; 4—port and starboard wing and center cargo tank No. 1; 5—port and starboard wings and center cargo tank No. 2; 6—port and starboard wings and center cargo tank No. 3; 7—port and starboard wings and center cargo tank No. 4; 8—midship pumproom; 9-10-11-12 port and starboard wing and center cargo tanks Nos. 5, 6, 7, and 8 respectively; 13—cofferdam; 14—fuel oil tank; 15—engine room; 16—boiler room; 17—after peak tank and steering gear.

Double bottoms are fitted, in way of the engine room and boiler room spaces. The tanks thus formed are used for makeup feed water, for fresh wash water, and for ballast.

Accommodations for the officers are arranged in the steel deck house of the bridge section. On the upper bridge the captain is provided with a spacious bedroom with bath adjoining and a large office. The radio

The four sister tankers described in this article will be of the same general appearance and dimensions as the steam tanker, Socony-Vacuum, shown here.

room is also housed on this deck. On the bridge deck below are bedrooms for first, second, and third officers, purser, and radio operator, a dining saloon for officers, pantry, gyro room and officers' bath.

On the poop deck at the after end of the machinery hatch are rooms for chief engineer; and first, second, and third assistants; with bath and other sanitary accommodations.

The seamen, firemen, stewards, oilers, and all the rest of the crew are housed on the main deck under the poop. Not more than four men are housed in any one room.

Wood is practically eliminated from the accommodations, all furnishings, lockers, and other equipment being of fire-resistant or fireproof materials.

● Deck Equipment

All deck machinery is operated by steam. Each of the tankers will have three 8¼-inch by 10-inch steam deck winches, for handling dry cargo, hose lines, hatch covers and machinery. All three winches are located on the center line of the ship, one just forward of the foremast, one just aft of the midship cargo pump room hatch, and one just aft of the main mast. There are two booms on the foremast and one on the after mast. The port and starboard ventilators serving the midship pump room are built up off the deck as derrick posts and equipped with fittings to take the booms served by the midship winch.

A powerful double windlass takes care of anchor chains and mooring lines forward. On the two Pan-American Petroleum vessels the usual 9x12 steam mooring winch is installed aft. Since the two vessels building for Socony-Vacuum contemplate operation in the Beaumont Canal they are provided with a center line hawse pipe aft and a powerful windlass on the poop deck for handling a stream anchor at the stern.

All of this steam deck machinery will be supplied by the American Engineering Company.

Ground tackle and hawsers to be carried by each of the four vessels are as follows:

Anchors

First bower	11,700 pounds
Second bower	11,340 "
Stream	4,060 "
Spare bower	9,660 "

Cast Steel Studlink Chain

2-9/16-inch diameter	300 fathoms
1⅜-inch diameter	120 "
6-inch cir. steel wire tow line	130 "
8-inch cir. Manila hawser	4-100 fathom lengths

Life saving equipment includes four 22-foot life boats, each of 25 person capacity. Two of these are carried on the upper bridge forward, and two on the poop deck aft. Each boat is swung on davits ready for emergencies. There is also carried, in chocks, on the poop deck, a 16-foot work boat.

The steering gear is hydro-electric of the auxiliary ram type as built by the American Engineering Company. In this type, the auxiliary ram (normally used as a brake) can be used in emergency for manual control of the rudder. This gear is controlled from the bridge by either electric telemotor or by the Sperry two-unit Gyro-pilot system. As its name implies this system consists of two units—one in the pilot house and one in the steering gear compartment. The pilot house unit contains the mechanism for detection of changes in course and determining the proper amount of rudder movement for their correction. The steering gear compartment unit includes an electric motor for actuating the controls of the electro-hydraulic steering gear, a magnetic relay panel for controlling this motor, an automatic magnetic clutch for connecting or disconnecting the motor to the ship's steering control, and an electric transmitter for repeating the movements of the rudder back to the pilot house unit.

This Sperry two-unit system provides a complete electric telemotor control of the rudder for either manual or automatic-gyro operation. A simple lever adjustment on the pilot house unit provides for either automatic operation, manual operation, or complete disconnection and return of control to ship's wheel.

● Emergency Steering Gear

A very interesting feature of the American Engineering Company steering gear as it will be installed in these tankers is the provision for emergency manual steering. The main tiller will have a jaw-type extension to engage the manual or emergency steerer, which will consist of two auxiliary hydraulic rams and cylinders mounted aft of the main steering gear. These auxiliary rams will be actuated from the deck above by means of an LP-4 Hele-Shaw pump, similar in design to the pump actuating the main steerer. This pump is mounted on a bed-plate which will also act as a make-up and leakage tank for the auxiliary hydraulic system. The auxiliary pump will be operated through three to one reduction gearing by a standard 5′6″ diameter steering wheel.

This emergency hydraulic gear will be capable of handling 15 degrees of rudder angle at 12½ knots speed.

The auxiliary ram cylinders are to be fitted with by-pass piping and shut-off valves so that the rams may be used as buffers to take rudder shock under normal steering conditions.

The rudder is of the balanced stream-line type with double plate surface and cast steel frame.

A Sperry electric rudder indicator will be installed in the pilot house, and a Sperry high intensity searchlight on the top of the pilot house.

A Sperry master gyro-compass is installed in a compartment on the bridge deck with repeaters at all navigation stations. The repeater on top of the pilot house is fitted for pelorus sights.

Ample provision is made for preserving perishable food stuffs as used in officers' and crew's mess, by the installation of a Carrier-Brunswick-International 2-ton refrigerating unit. This unit is operated with a direct expansion ammonia compressor driven by a 5-horsepower General Electric Motor.

A Sperry gyro compass and Sperry 2-unit gyro helmsman installation of same type as will be installed on four sister tankers building at Sun. Above: pilot house and flying bridge; below: steering engine compartment.

● Oil Cargo Pumps

Cargo oil on these tankers will be pumped through a 12-inch suction main in the center tanks and a 10-inch suction main port and starboard serving the wing tanks. Each of these three mains will be paralleled by a 4-inch stripper line.

In the midship pump room will be located four Northern geared rotary oil pumps, each driven through single reduction gearing by a Terry steam turbine taking steam at 150 pounds per square inch. Two of these pumps will have a capacity each for delivering 2700 barrels per hour, against a head of 100 pounds per square inch. The other two pumps will each deliver 1500 barrels per hour under the same condition.

Two pumps of the same type and drive will be housed in the forward pump room, one having a 2700 barrels per hour capacity, and the other 1500 barrels per hour. The total capacity of these pumps could handle the total cargo capacity of the tanker in about ten hours.

● Machinery Installations

In general, the propulsion machinery on each tanker will be a De Laval cross compound steam turbine unit taking steam from Foster-Wheeler watertube steam generators and driving a single propeller through double reduction gearing.

The steam generating equipment for each of these vessels will consist of Foster-Wheeler three drum, bent tube, "A" type boilers fitted with water walls and designed to operate at 400 pounds working pressure. There will be three units for each vessel, two of them being main boil-

	Main boilers	Auxiliary Boilers
Boiler heating surface	3,407 sq. ft.	4,350 sq. ft.
Economizer	2,304 sq. ft.	....
Superheater surface	2,800 sq. ft.	....
Boiler pressure designed	450 lb./sq. in.	450 lb./sq. in.
Steam generated per hour	19,000 lb.	24,000 lb.
Temperature—superheater outlet	720° F.	....
Desuperheated steam	6,000 lb./hr.	....
Temperature desuperheated steam	467° F.	....
Temperature of feed water	216° F.	216° F.
Furnace volume	544 cu. ft.	610 cu. ft.
Oil burners, Todd	3	5
Efficiency	86%	80%

Principal characteristics of boilers.

ers and one an auxiliary boiler designed for 450 pounds pressure but working normally at 150 pounds. The main boilers will be used for propulsion and the auxiliary boiler will be used for port work, cargo, heating and pumping. The main and auxliary boilers will be identical with the exception of elimination of superheaters and economizers from the auxiliary boilers. This gives interchangeability of parts and permits the use of the auxiliary boiler as a steam producer for propulsion in case of outage on one of the main units. In the auxiliary boilers the space ordinarily occupied by the superheater will be used for the addition of boiler tubes, thus increasing the boiler heating surface. There is somewhat greater furnace volume in the auxiliary boilers and five oil burners are used, as compared with three in the main boilers. A comparison of the boilers is shown in the tabular statement herewith.

The first two rows of fire tubes on each side of the furnace are 2 inches in diameter, in order to give ample water circulation in tubes driven at high rates of heat absorption. The balance of the boiler tubes are 1½ inches in diameter; the economizer tubes are 2 inches in diameter and the superheater tubes are 1¼ inches in diameter. As to material, the economizers are built of seamless steel drawn tubes, covered with cast iron, extended surface grilled rings, providing six times the heat absorbing surface of the bare tubes per lineal foot.

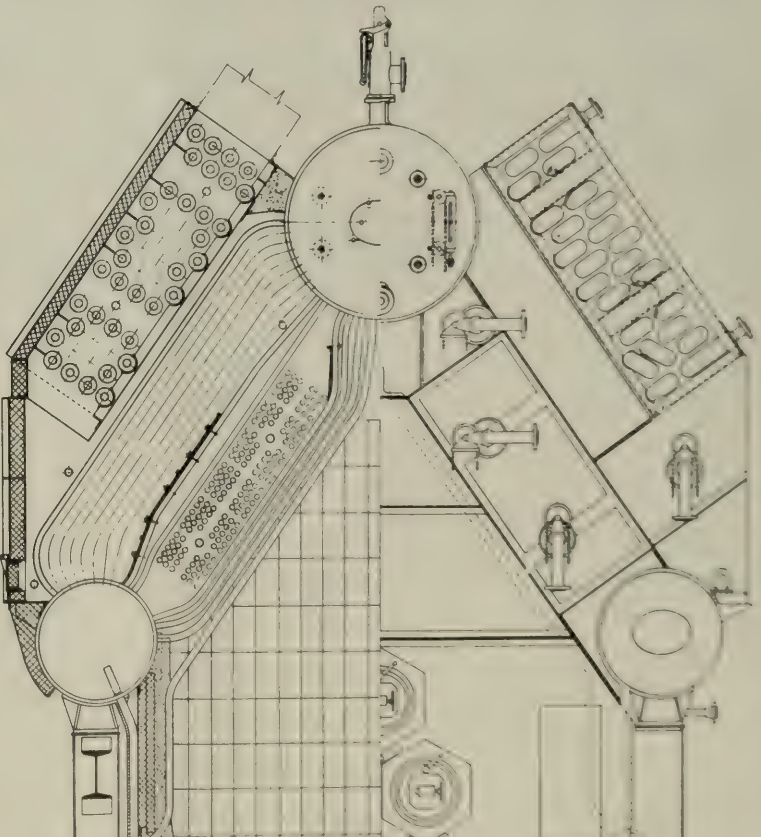
The superheaters are of bare tubing, chrome vanadium, seamless steel. The construction of both superheater and economizer is such that any element in either may be removed and replaced without disturbing the balance of the heating elements.

The boiler drums are rivetless and these ships are among the earliest that will be fitted with all welded drums. To that extent they are notable in marine history, since at the time of this writing there are only two ships under the American flag in salt water service fitted with welded boiler drums. The welding is done in accordance with the stringent regulations applied by the government, and based upon the experience of drums welded for use in U. S. naval vessels. The drums are stress relieved and x-rayed in order to remove the slightest doubt as to perfection of the weld. The x-ray machine is fitted with a 300,000-volt tube and capable of showing minute flaws in metal more than 4 inches thick. The test procedure now adopted by the U. S. Steamboat Inspection Service, Department of Commerce, insures beyond question the complete fusion of metals. It was not until many years of satisfactory operation with welded drums had been recorded in both stationary and naval service that the U.S.S.I.S. authorized welded drums for use in merchant steamers.

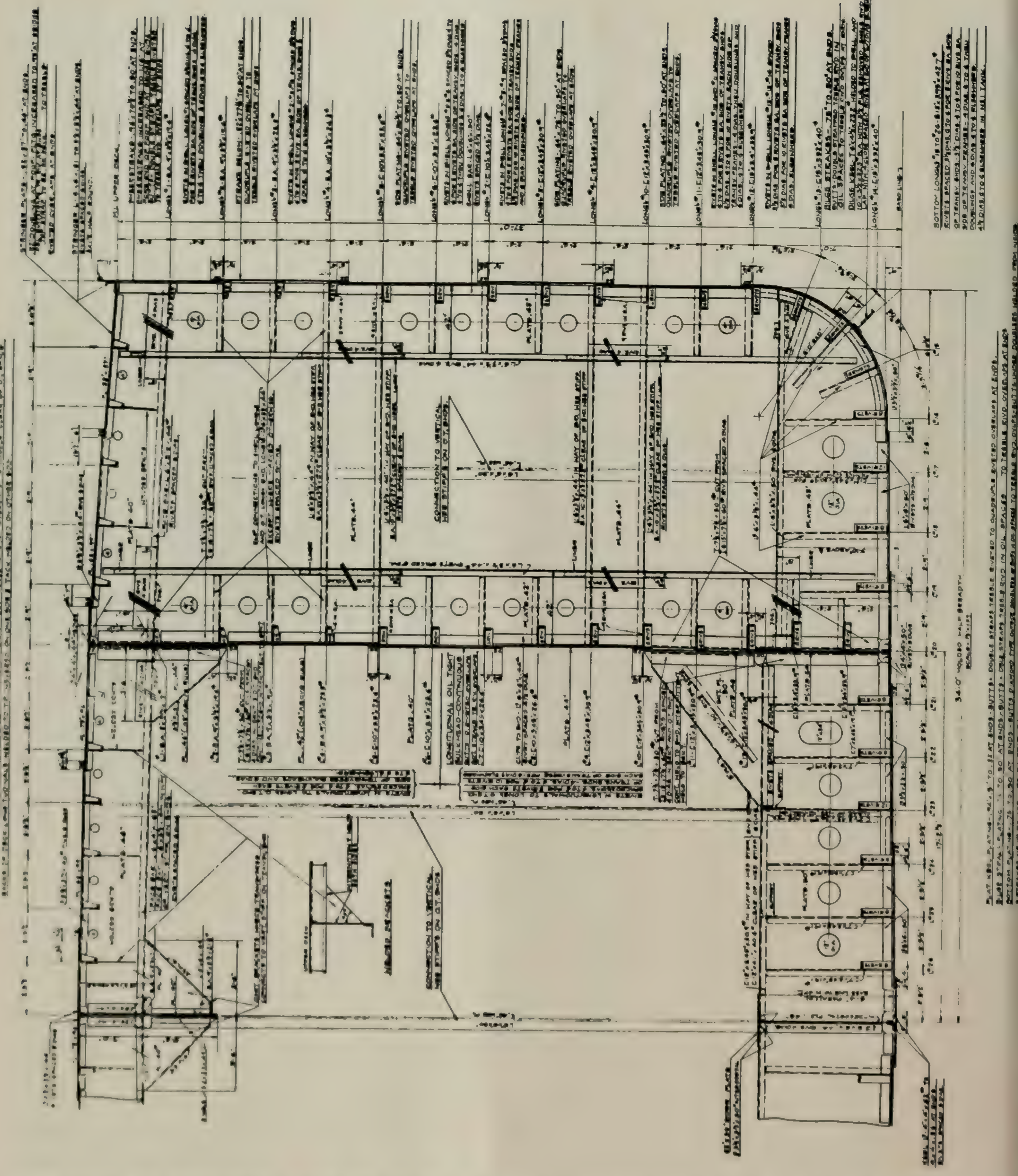
All steaming units will be fitted with mechanical soot blowers to maintain clean surfaces for the absorption of heat, and therefore, high year round operating efficiency. Stack temperatures will be in the neighborhood of 300 degrees and these four vessels will be among the most economical in cargo transportation service.

The famous Todd Hex-Press type mechanical pressure atomizing oil burner with air register, will be used on all boilers. Three of these burners are installed on each of the main boilers, and five on the auxiliary boiler.

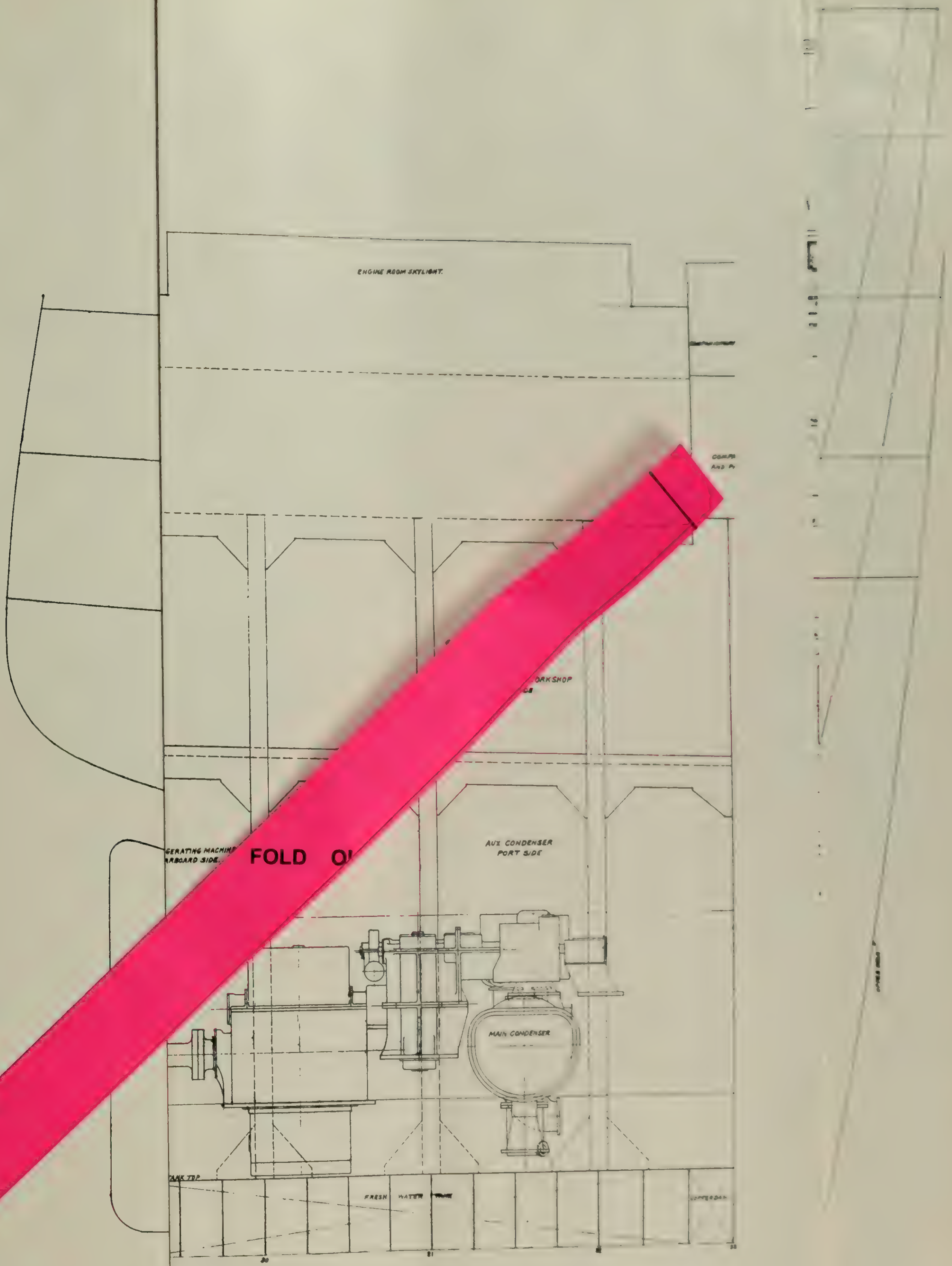
Combustion is carried out under forced draft but without a closed fireroom. The furnaces are air jack-

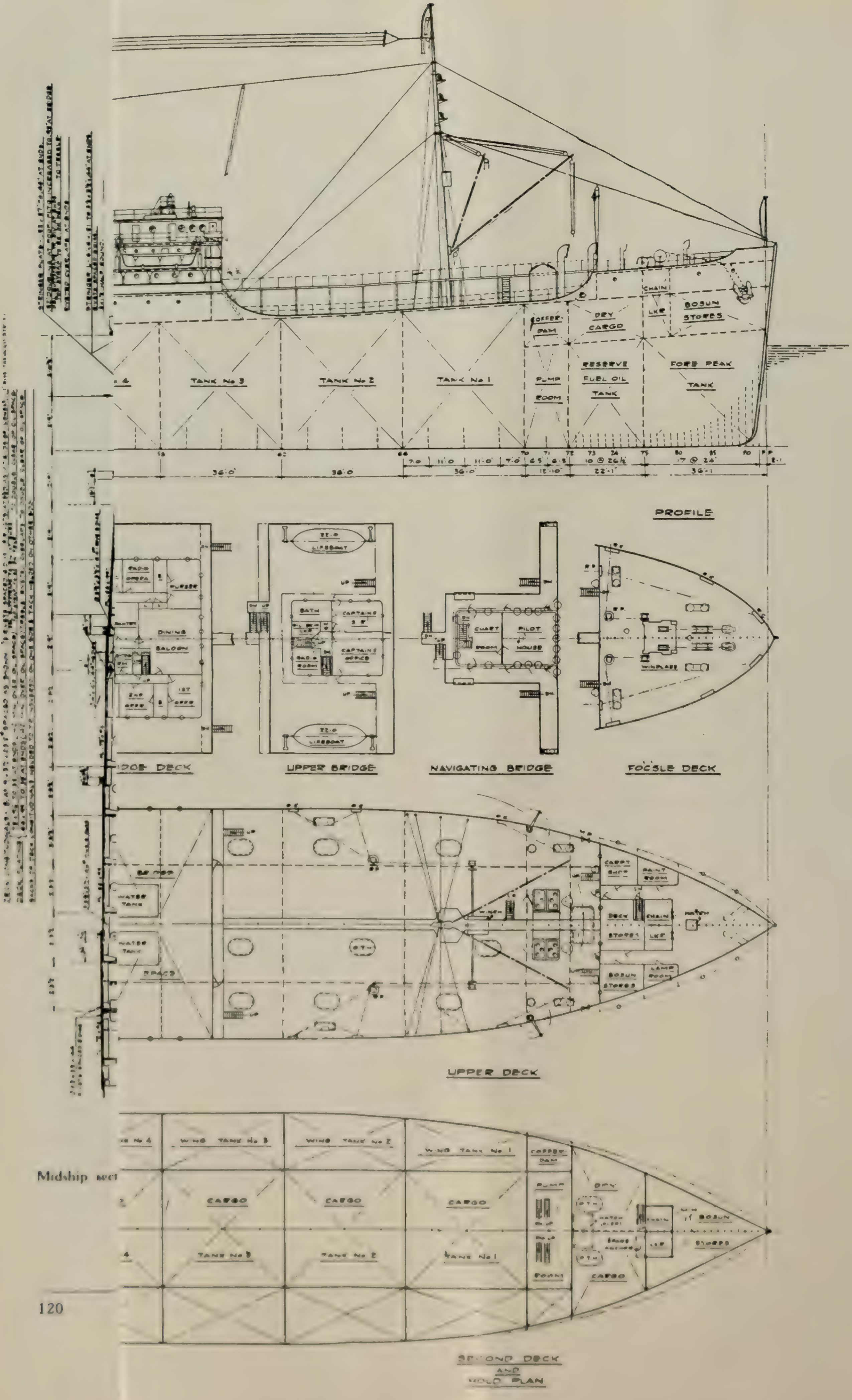


Elevation of Foster-Wheeler three drum bent tube "A"-type boiler.



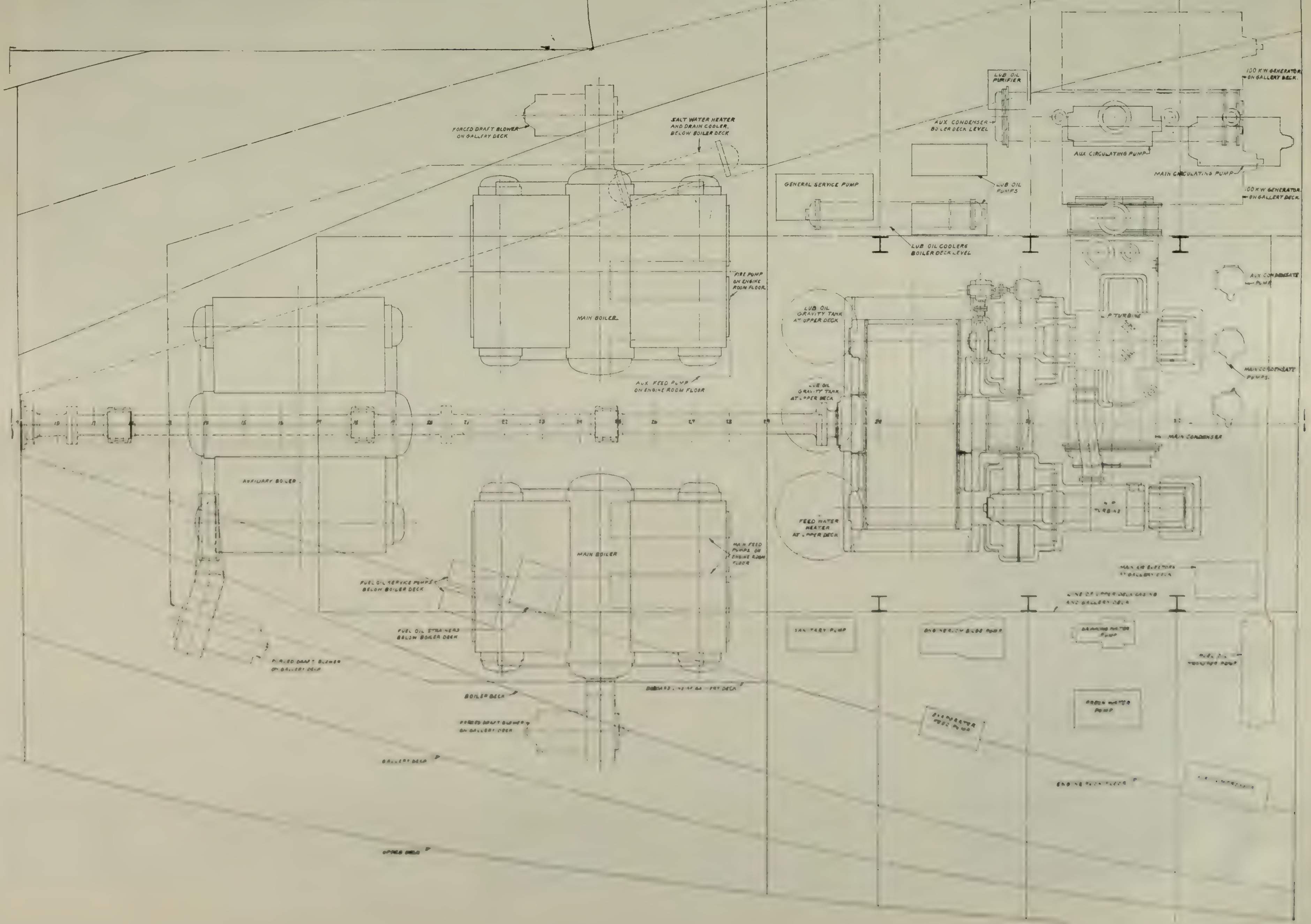
Midship section: This drawing should be read from the right hand side of page as the bottom of drawing and of ship. It shows the arrangement of framing in the Isherwood bracketless system.

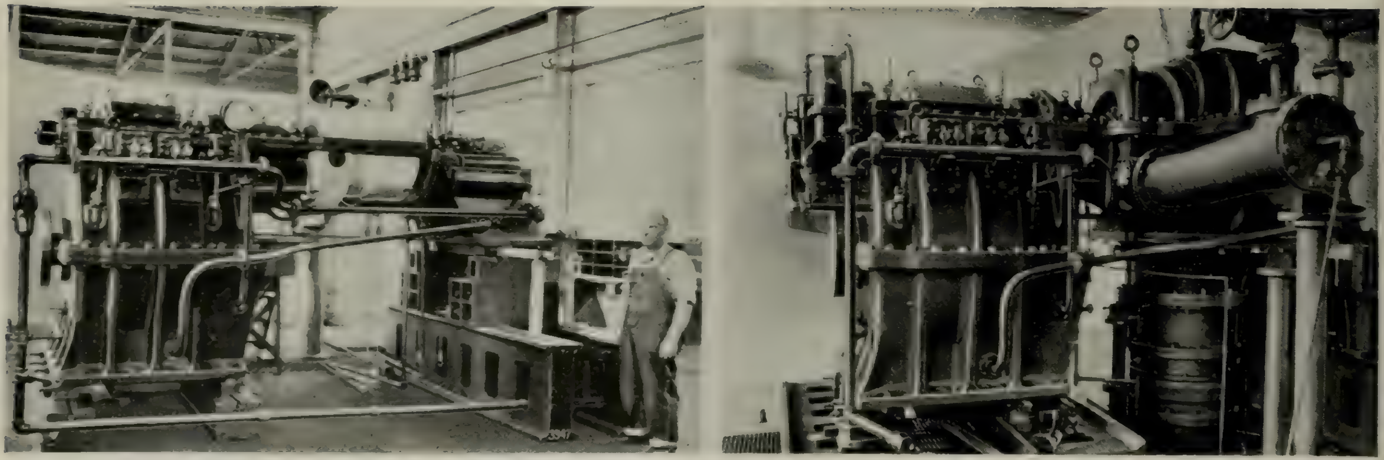

ENGINE ROOM SKYLIGHT.
COMP
AND P
ORKSHOP
GERATING MACHINE
ARBOARD SIDE.
AUX CONDENSER
PORT SIDE
MAIN CONDENSER
TANK TOP
FRESH WATER
30
31
33



Midship sect

ARRANGEMENT PLAN OF MACHINERY SPACES SHOWING LOCATION OF ALL PRINCIPAL UNITS.


FORCED DRAFT BLOWER ON GALLERY DECK
SALT WATER HEATER AND DRAIN COOLER, BELOW BOILER DECK
MAIN BOILER
FIRE PUMP ON ENGINE ROOM FLOOR
AUX. FEED PUMP ON ENGINE ROOM FLOOR
AUXILIARY BOILER
GENERAL SERVICE PUMP
LUB OIL PURIFIER
AUX CONDENSER BOILER DECK LEVEL
LUB OIL PUMPS
LUB OIL COOLERS BOILER DECK LEVEL
AUX CIRCULATING PUMP
MAIN CIRCULATING PUMP
100 K.W. GENERATOR ON GALLERY DECK
100 K.W. GENERATOR ON GALLERY DECK
AUX CONDENSATE PUMP
H.P. TURBINE
MAIN CONDENSATE PUMPS
MAIN CONDENSER
L.P. TURBINE
LUB OIL GRAVITY TANK AT UPPER DECK
LUB OIL GRAVITY TANK AT UPPER DECK
FEED WATER HEATER AT UPPER DECK
MAIN FEED PUMPS ON ENGINE ROOM FLOOR
MAIN BOILER
FUEL OIL SERVICE PUMPS BELOW BOILER DECK
FUEL OIL STRAINERS BELOW BOILER DECK
FORCED DRAFT BLOWER ON GALLERY DECK
BOILER DECK
FORCED DRAFT BLOWER ON GALLERY DECK
GALLERY DECK
UPPER DECK
SANITARY PUMP
DRINKING WATER PUMP
FRESH WATER PUMP
EVAPORATOR FEED PUMP
ENGINE ROOM FLOOR



De Laval cross compound turbine set-up for shop tests. High pressure unit with its pinion and gear at left; low pressure unit at right.

eted through employment of forced draft fans, taking air at top of fire room and discharging it into a jacket at the top of the rear wall of the furnaces. This air duct extends down the rear wall of the furnace to the floor, then under the furnace floor to the front of the boiler and up the front of the boiler to the oil burners, thus cooling the major portion of the front wall.

These marine steam generators are the most recent development of the familiar applications of the "A" type boiler design which started with four Grace Line boats a few years ago and proved equally successful in the tankers, Socony - Vacuum and Magnolia. The steam generating units will be furnished complete by Foster Wheeler Corporation and are in effect a repeat order from the same operators.

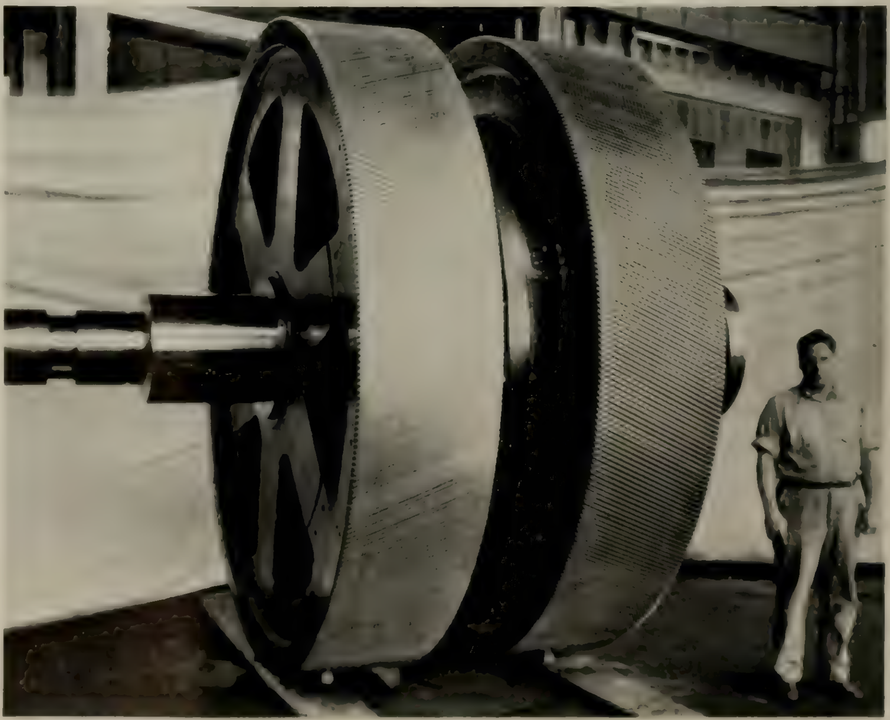
Each boiler is supplied with forced draft by a horizontal motordriven blower having a capacity of 9000 cubic feet per minute of air at 120 degrees Fahrenheit and 3-inch pressure. These three blowers supplied by the American Blower corporation will each be driven by a 7½ horsepower General Electric motor.

The steam generating plant is supplied with feed water by 3 De Laval turbine drive multi-stage centrifugal pumps, each of which has a capacity of 108 gallons per minute against a pressure of 485 pounds per square inch. The De Laval turbines driving these units are of the two stage axial flow type and developing 60 horsepower. Steam from this generating plant is delivered to the high pressure end of the main propulsion turbine unit at 375 pounds per square inch and 700 degrees Fahrenheit temperature. This main propulsion unit is of the same reliable De Laval cross compound type rated at 4000 shaft horsepower which has made such an enviable record in many modern American tankers.

The high pressure turbine rotor turns over 5480 revolutions per minute at normal load. It has eleven stages, the first being of the velocity compound type, and the remaining ten of the impulse type.

The low pressure turbine rotor casing contains an astern unit of two pressure stages as well as an ahead unit of seven impulse stages.

The pinion on the high pressure rotor shaft has a pitch diameter of 8.166 inches and that on the low pressure rotor shaft 10.5 inches. Each of these pionions meshes with a gear having a pitch diameter of 63.666 inches. These first reduction gears have a speed of 703 revolutions per minute, and each of them drives a pinion with a pitch diameter of 13.647 inches which meshes with the common low speed gear. This gear has a diameter of 127.98 inches and drives the propeller shaft at 75 revolutions per minute. Thrust of the propeller shaft is taken on a bearing of the Kingsbury type and the tur-



This huge double helical De Laval gear wheel is the low speed power transmitter which imparts 4000 H.P. at 75 r.p.m. to the propeller shaft.

bine unit is fitted with a turning gear operated by a 10-horsepower General Electric motor.

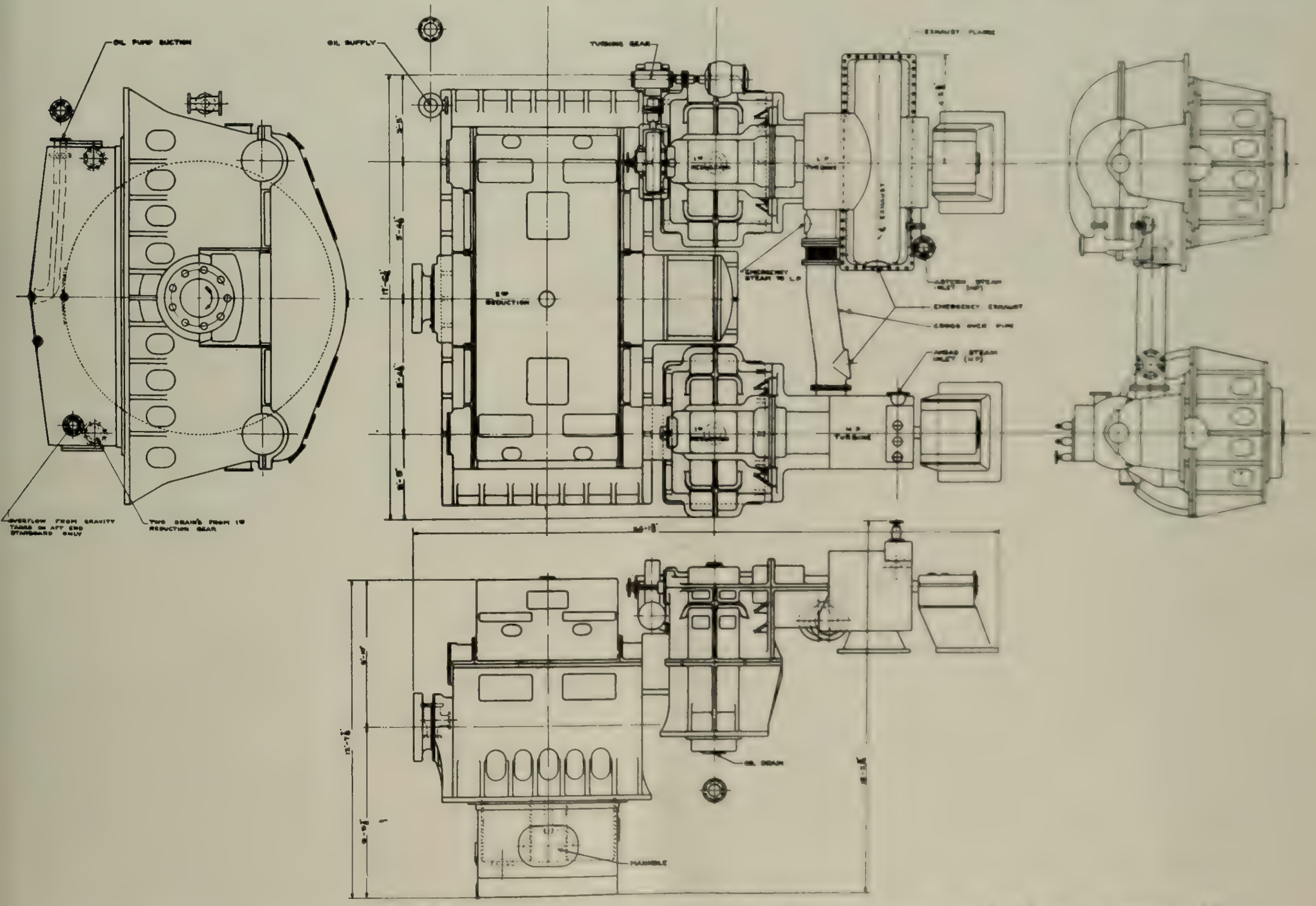
Two gravity oil tanks, each of approximately 1000 gallons capacity, provide forced feed lubrication to the main turbines and reduction gears. Oil from the gear cases and turbine cases drains into a sump tank of 800-gallon capacity. From the suction well, in this tank, through duplex strainers, the oil is pumped back to the gravity tank by two De Laval IMO motor driven rotary pumps, each having a capacity of 200 gallons per minute at 4500 pounds per square inch pressure and each driven by a 10-horsepower General Electric motor. Provision will be made for the installation of an oil purifier with a capacity of 200 gallons per hour. Lubricating oil in this system will be cooled by two Paracoil horizontal straight-tube oil coolers each having a capacity of reducing 200 gallons of lubricating oil per minute from 120 degrees to 100 degrees Fahrenheit. These coolers were supplied by the Davis Engineering Company.

The low pressure unit of the main propulsion turbine is mounted directly over the condenser which is of the Foster-Wheeler 2-pass, horizontal cylindrical type, installed athwart ship. This condenser will be equipped with tubes furnished by the American Brass Company, and will have a total cooling surface of 4800 square feet. It will be served with cooling water by a De Laval motor-driven centrifugal pump having a capacity of 6200 gallons per minute against a head of 28 feet, and driven by a General Electric 60-horsepower motor, at 690 revolutions per minute. Condensate will be handled by two De Laval vertical centrifugal pumps, each driven by a 10-horsepower General Electric motor and each having a capacity for 105 gallons per minute against a 125-foot head. The condenser is fitted with a Foster-Wheeler twin two-stage air ejector, with inter and after coolers. Each unit of this ejector has a capacity of 20 pounds of air per hour from 28¼ inch vacuum.

All of the machinery equipment thus far described together with feed water heaters, evaporators, fuel oil transfer pumps, and a number of other items, is installed for the seemingly very simple purpose of economically and efficiently generating 4000 horsepower and transmitting that power to a single propeller shaft. On the after end of this shaft, a propeller absorbs that power, transmitting it to the water and propelling the hull at 13 knots speed. This propeller is of the four-bladed built-up type, with semi-steel hub and manganese bronze blades. It has a tip diameter of 19 feet 8 inches, a pitch of 18 feet 4 inches, and 104 square feet of projection area. The blades are of the streamline section type with variable pitch, and are designed to absorb 4000 shaft horsepower at 75 revolutions per minute when the vessel is travelling at 13 knots.

● Auxiliary Power Plant

To provide electric power for lighting the ship and for motor-driven



End elevations, plan and side elevation of De Laval cross compound, double reduction gear, 4000 S.H.P. marine steam turbine.

auxiliaries, there will be installed on a gallery deck in the engine room of each vessel, three turbine driven electric generators. Two of these will be Westinghouse geared turbine generating sets each of 100 kilowats capacity, taking steam at 375 pounds per square inch throttle pressure. Each of these units is capable of handling the normal needs of the vessel at sea. The third unit will be a General Electric 50-kilowat steam turbine generating set which is installed for taking care of the needs of the ship in port. This set will operate normally on saturated steam of 150 pounds pressure per square inch, and is capable of operating on steam from the shore at pressures as low as 75 pounds per square inch.

Exhaust steam from these sets is taken care of by the main condenser at sea and by an auxiliary condenser in port, the latter being of the horizontal two-pass type having a cooling surface of 1400 square feet and being provided with circulating water by a double suction De Laval centrifugal pump of the horizontal type having a capacity of 1200 gallons per minute when driven by a 15-horsepower motor.

● Electric Auxiliaries

The electrically operated auxiliaries in addition to those already mentioned include the following:

A rotary pump for draining the engine room bilges driven by a 10-horsepower motor;

One single stage centrifugal sanitary pump driven by a 7½ horsepower motor;

One fresh water pump of the rotary type driven by a 3-horsepower motor;

One drinking water pump of the rotary type;

One evaporator feed pump of the rotary type driven by a 1-horsepower motor;

Two rotary fuel oil service pumps each driven by a 3-horsepower motor;

One rotary fuel oil transfer pump, driven by a 25-horsepower motor;

One two-stage air cooled air compressor driven by a 15 horsepower motor;

One electric torsion meter.

● Steam Driven Auxiliaries

In addition to the steam driven deck machinery, already mentioned, and the steam turbine driven feed pumps, there are several important steam driven pumps for general purposes. These include:

One De Laval two-stage centrifugal fire pump driven by a De Laval two-stage velocity-compound axial-flow turbine of 85 horsepower;

One rotary fuel oil transfer pump with a capacity of 300 gallons per minute against a pressure of 300 pounds per square inch driven by a single-wheel radial flow turbine at 25 horsepower;

Three horizontal duplex 7-inch by 6-inch by 10-inch reciprocating pumps for bilge service, one in the engine room, one in the mid-ship pump room, and one in the forward pump room.

● Miscellaneous Auxiliaries

The other auxiliary apparatus and heat transfer equipment will include:

Two double coil fuel oil heaters capable of raising 3500 pounds per hour from 100 degrees Fahrenheit to 300 degrees Fahrenheit;

One deaerating film spray feed water heater capable of raising 50,000 pounds per hour from 96 degrees Fahrenheit to 216 degrees Fahrenheit;

One horizontal straight tube, 2-pass, salt water heater, with a capacity of raising 360 gallons per minute from 70 degrees Fahrenheit to 190 degrees Fahrenheit (salt water thus heated is used for cargo cleaning);

One horizontal straight tube cooler with a cooling surface of 148 square feet for cooling the drain from the salt water heater;

One salt water heater augmentor of the direct steam contact type with a capacity of raising 360 gallons per minute from 90 degrees Fahrenheit to 165 degrees Fahrenheit for tank cleaning;

One single pass horizontal straight tube cooler with a surface of 42 square feet for cooling trap drain;

One duplex condensate filter and grease extractor having a capcity for handling 50 gallons of condensate per minute;

One vertical evaporator having a capacity of 35 tons per 24 hours;

One vertical distiller, having a capacity of 4000 gallons per 24 hours.

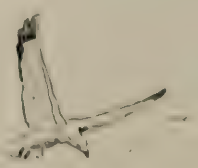
An important feature of the equipment of the modern tanker is an effective means of thoroughly cleaning the cargo oil tanks. The majority of tankers built today are designed and constructed so that their tanks are suitable for carrying any kind of liquid petroleum product, and frequently they must carry and handle cargoes composed of several grades of petroleum derivatives.

In order that the tank ship operator may take full advantage of these features of flexibility in handling and carrying, he must be in a position to promptly and economically clean any tank for a change in cargo. A comparatively new system known as the Butterworth System of tank cleaning has made such a record for itself in numerous installations that it is now regarded as practically standard equipment in the world's largest tanker fleets.

This system comprises a number of Butterworth patented portable nozzle heads, which are rotatable through both horizontal and vertical planes simultaneously, means for introducing these nozzle heads into all cargo tanks, means for heating salt water to a temperature of 175 degrees Fahrenheit, means for pumping this heated salt water to the nozzles at a pressure of 175 pounds per square inch in sufficient quantities to supply each nozzle in use with approximately 500 gallons per minute.

The fire pump is ordinarily used to deliver the sea water to the nozzles and connections are arranged on the fire main convenient to the oil tank hatches. The hot salt water under pressure reaches all interior surfaces of the tank and the rust, scale, and petroleum residue is washed down into the bilges from which it is pumped overboard through the stripper suction and discharge lines.

The four sister tankers now building for the Socony-Vacuum Oil Company, Inc., and the Pan-American Petroleum and Transport Company, at the Chester yard of the Sun Shipbuilding and Dry Dock Company will be equipped with the Butterworth System.



Maritime Book Reviews

MERCHANT SHIPS, 1936—compiled and edited by Pay-Lieutenant E. C. Talbot-Booth, R.N.R.; 690 color illustrations and 1268 line drawings by the editor; printed on heavy coated paper; issued January, 1936, by Samson Low, Marston & Co., Ltd., London; price two guineas, net.

This is an enlarged, revised, and brought-up-to-date edition of "British Merchant Ships" by the same editor. "Merchant Ships, 1936" not only brings "British Merchant Ships" up to date, but adds the merchant ships of twenty of the other principal maritime nations.

Under each country, the illustrations and descriptive data are divided into six sections:

1—the merchant marine flags of the country in color;

2—the flags and funnels of the ship operating companies of the country in color;

3—plates in color showing (to the scale of 150 feet to one inch) the leading companies of the country;

4—drawings in black and white (to the scale of 150 feet to one inch) with full descriptions of all the principal ships of the country;

5—lists of fleets and data of all the principal ship-operating firms of the country;

6—list of shipbuilders, glossary of terms used in text, records and index of all ships of the country.

This is a standard work of reference for all who are interested in the quick recognition of passing ships. It performs the same service for the merchant marine that "Jane's Fighting Ships," by the same publishers, does for the navy. "Merchant Ships, 1936" should be on the bridge of every seagoing vessel, and in the principal offices of every shipping organization.

THE NEW IMPERATIVE. By Walter Lippman. Fifty-two pages, bound in red buckram with gold stampings. Published by The Macmillan Company.

This very handy little volume, easily carried in the coat pocket, consists of an introduction and two addresses, covering—in a scholarly and logical manner—the author's idea of the influence of the "crisis" (depression) "upon the traditional view of the function of government in the United States."

He starts with the rather debatable statement: "It has, I think, been clearly established that government must henceforth hold itself consciously responsible for the maintenance of the standard of life prevailing among the people. This is, I believe, the new imperative, which takes its place alongside the older imperatives to defend the nation against attack and preserve domestic peace."

The fifty pages following this declaration are an apologia for the author's belief, set out very logically and in a pleasing manner, and with convincing earnestness.

A very interesting and thought-provoking individual reaction to the "New Deal."

METALLURGICAL DIALOGUE by Albert Sauveur; 166 pages; 5 inches by 8 inches; with several full page portraits of metallurgists; bound in red buckram with gold stampings; published by the American Society for Metals.

Dr. Albert Sauveur is the Gordon McKay Professor of Metallurgy and and Metallography at Harvard University, and is a world recognized authority on the metallurgy of steel. In this very delightful little book he carries on an imaginary dialogue, after the Platonic method, with a student, beginning:

Pupil: "Master, do we know why steel hardens when plunged red hot into cold water?"

Master: "Before attempting to answer your question, it will be profitable to analyze it, and to describe in a more accurate and precise manner the operation you have in mind. Let me first ask you if you know what steel is."

From this start, the student and reader are led by logical and interesting steps through the various factors involved in iron alloys, and through the evolution of metallurgical theory and process in relation thereto.

Finally, we arrive at this conclusion:

Master: "It would not be difficult to continue our conversation, as our subject is far from being exhausted. Let us resist the temptation, however, that some find so irresistible, to continue talking when silence is wiser.

Pupil: "I accept your decision, but not without regrets. In our quest for an answer to my first question, I have learned something of the ancient art, now a science, of metallurgy. I shall pursue its study; and who knows but some day I shall tell the world why steel hardens when rapidly cooled from a high temperature?"

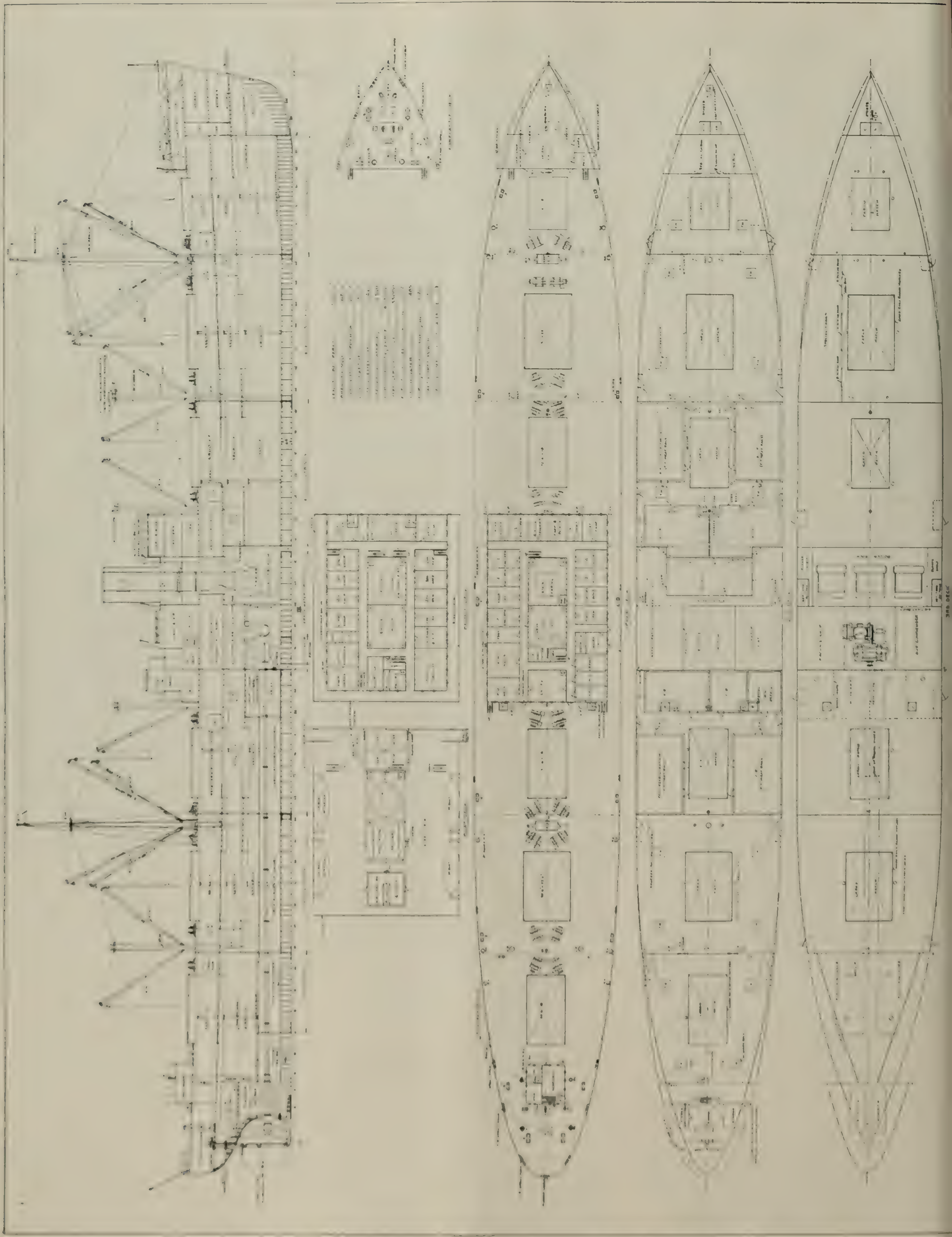
Master: "I wish you Godspeed."

ENGINEERING ACHIEVEMENTS by H. W. Cope; 56 pages copiously illustrated; bound in gold covers with blue print; published by the Westinghouse Electric & Mfg. Company.

This book is a de-luxe edition of the annual Westinghouse publication, Engineering Achievements, and was prepared as an expression of the just pride held by the Westinghouse organization in fifty years of progress and growth, and of their acknowledgment of praise and credit to George Westinghouse—"our great founder who visioned so truly, builded so soundly, and who set us an inspiring example to continue his great work."

Sixteen pages illustrated from old photographs tell the story of the early struggles and achievements of George Westinghouse "the leader whose courage never failed," and the group of brilliant young engineers and scientists whom he gathered into his organization. The balance of the book tells of the recent achievements of the Westinghouse Electric & Manufacturing Company in all the fields of modern electrical engineering.

Engineering Achievements is an authentic record of tremendous engineering progress and a worthy souvenir of the golden anniversary of the founding of one of America's greatest industrial and engineering organizations.



Inboard profile and general arrangement deck plans of proposed new Matson cargo liners.

Proposed Matson Cargo Liners

For several months past, the technical staff of the Matson Navigation Company has been busy preparing plans and specifications for two alternate designs for cargo liners. On March 14, plans and specifications for one of these designs were issued to all principal American shipbuilders. On March 28 plans for the other design were issued. Bids were requested for two vessels on each design; these bids to be opened May 4. After analysis of all bids the Matson Navigation Company will, if prices are satisfactory, build two vessels to the design that proves most economical.

These designs are both for purely cargo vessels. In general, the hulls are along identical lines, and of practically the same commercial dimensions, each calling for approximately 11,500 tons deadweight cargo capacity. Each design calls for raked stem, cruiser stern, three-deck type with flush weather deck, six holds, six hatches, two masts, eight derrick posts, twenty winches, numerous side ports, machinery amidships and all crews' quarters amidships.

The principal differences between the two designs lie in the sea service speed requirements. Design No. 1 calls for 13½ knots on single screw propulsion requiring 6500 shaft horsepower. Design No. 2 calls for 16 knots on twin screw propulsion, requiring 11,500 shaft horsepower.

Both designs call for highest class at the American Bureau of Shipping, and will comply with all governing rules of the United States Steamboat Inspection Service.

On the facing page we reproduce the inboard profile and general arrangement deck plans of the single-screw, 13½ knot vessel.

It will be noted that the propulsion machinery consists of a high-pressure and a low-pressure turbine, arranged cross compound, and driving the propeller shaft through double reduction gearing. The high pressure turbine takes steam at 400 pounds pressure and 700 degrees Fahrenheit total temperature. This steam is generated in three watertube boilers worked on forced draft with closed fire room.

The deck machinery will be operated by steam, and the twenty winches installed will each be capable of moving its load at the rope speed necessary to meet the requirements of the famous "Matson sugar cycle," said to be the fastest winch movement of sacked merchandise in regular commercial use. In addition to the booms listed in the tabular statement, the inboard profile shows on the foremast one special boom with 35-ton capacity for taking care of unusual lifts.

Perhaps the greatest advance in this design as compared with standard commercial cargo carriers, lies in the accommodations for the crew. All grades are housed in the bridge erection amidships. The licensed officers are on the bridge deck and the crew on the upper deck, directly below the officers. Every room is an outside room with ample natural light and ventilation. In the crews' quarters, all the berths are built in with drawers below, as officers' berths are usually built.

The rooms are all large, and not more than four persons are quartered in any one room. Ample sanitary provision is made for bathing. A "crew's lounging room" is to be comfortably fitted.

The small steel deck erection aft, houses a well-appointed hospital, and access to the steering gear compartment.

Every marine-minded citizen of the Pacific coast is hoping that the order to build these ships will come to a Pacific coast shipyard. The ships were designed on the Pacific coast, will be built for a Pacific coast shipping firm, are designed for Pacific ocean service, and should be built at a Pacific coast shipyard.

PRINCIPAL DATA OF PROPOSED FREIGHTERS

Matson Navigation Company

	1	2
Type	Freight only	Freight only
Propulsion	Steam-Single Screw	Steam-Twin Screw
Approximate Speed	13½ Knots	16 Knots
Length, B.P.	500 Ft.	520 Ft.
Beam	68 Ft.	72 Ft.
Depth	42 Ft.	42 Ft.
Decks	3	3
Holds	6	6
Hatches	6	6
Cargo Side Ports, each side	10	11
General Cargo—cu. ft.	615100	591590
Refrig. Cargo—cu. ft.	33000	33900
Refrig. Chambers	9	9
Deadweight, approximate	14900	15200
Fuel Capacity	2617 Tons	3194 Tons
Fresh Water Capacity	485 "	420 "
Molasses Tank Capacity	940 "	2290 "
Masts	2	2
Derrick Posts	8	8
Cargo Booms	5 & 8 Ton	5 & 8 Ton
Winches	Steam, cut teeth, enclosed gear.	Steam, cut teeth, enclosed gear.
Windlass	Electric	Electric
Capstan	"	"
Steering Engine	Electro-hydraulic	Electro-hydraulic
Boilers, Water tube	3, enclosed Fire Room	4, enclosed Fire Room
Turbines	2 Cross compound	4 Cross compound
Gears	Double Reduction	Double Reduction
Steam Conditions	400 lb. per sq. inch, 700 degrees	400 lb. per sq. inch, 700 degrees
Shaft Horse power, total	6500, approximate	11500, approximate
Auxiliaries, Engine Room	Mostly electric	Mostly electric

James Watt—An Appreciation

By Andrew Baxter, Jr.

President, St. Andrews Society of the State of New York

I address you, not as an engineer or a scientist, but as President of Saint Andrew's Society of the State of New York—a Society of Scotsmen—proud of our fellow Scot whose memory we are honoring today.

We are proud of him for what he did and what he was. We are proud of his genius and of his character; all the more proud because, like many of our famous men, he came of humble folk and his success was won by ability and by hard work and the overcoming of many difficulties.

His great grandfather was a farmer in Aberdeenshire, and perished in one of the early conflicts in the long struggle of the Covenanters for religious freedom. His property was confiscated, and his orphan son, Thomas, was taken under the care of distant relatives. Eventually Thomas Watt found his way to Crawford's Dyke, then adjoining and now part of Greenock, where he founded a school of mathematics and taught this branch, as well as that of navigation. He attained great success in this field, and was also, for several years, the chief magistrate or baron bailie. He died in 1734 at the age of ninety-two.

This Thomas Watt had two sons. The elder, John, died in 1737 and left among other things a survey of the course of the Clyde which was afterwards published by his brother, James. James was the father of this great engineer.

James Watt, born in 1736, was a very delicate child. His mother, whose family name was Muirhead, gave him his first lessons in reading. Writing and arithmetic he learned from his father. He attended the public elementary school at Greenock. Continual ailments, however, prevented young Watt from regularly attending school. For the greater part of the year he was confined to his room, and there devoted himself to study without any assistance from others. His father provided a set of small tools for him in the shop among the workmen, and young Watt soon revealed his wonderful manual dexterity in producing complicated models.

At the conclusion of his address, Mr. Baxter read the following cablegrams:

"On the occasion of the unveiling of a memorial plaque of James Watt at the site of his birthplace, the citizens of Greenock send you their cordial greetings and good wishes for a successful celebration of his two hundredth birthday."

John W. Bell, Provost.

"The Institution of Engineers and Shipbuilders in Scotland send warmest greetings and best wishes to those taking part in the Watt Bicentenary celebrations at Philadelphia, and hope that the meeting will be an encouragement and an inspiration to those who follow the great master."

"The general Committee of Lloyds Register of Shipping send greetings on occasion of Watt bicentenary celebrations and join with all assembled in Philadelphia in honouring the memory of one whose contributions to the advancement of steam propulsion of ships render him one of the world's immortals."

The banks of Loch Lomond developed his taste for the beauties of nature and for botany, and his rambles over the hills of Scotland led him to study mineralogy. He entered the cottages of the poor to study character and listen for hours to the local traditions, popular ballads, and wild superstitions. When bad health confined him to the house, chemistry was the principal subject of his experiments. He also studied general physics, and greedily perused all books on medicine and surgery that he could procure.

When his father's business came to grief in 1755 he made his way to London, that Mecca of the Scot, where he learned the trade of "philosophical instrument maker" or, as we should say nowadays "scientific instrument maker." On his return to Glasgow within a year, he was prevented by the Guilds from opening a shop, on the ground that he had not served his full term of apprenticeship. He was looked on as an intruder—and the trades obstinately refused to allow him to set up even the humblest workshop. The University of Glasgow took him under its protection. At the age of 21 he was given a room in the Old College and the title of "mathematical instrument maker" to the University.

The University did not know what that kindly act was to mean for mankind, and we still associate its name with James Watt and Lord Kelvin.

Watt was by nature of an enquiring turn of mind. There is a story told of him as a boy. I venture to tell it, though some declare it to be fiction.

You will find it in the book called "Discovery" written by Gregory. James Watt's aunt, Mrs. Muirhead, said to him one evening—"James Watt, I never say such an idle boy. Take a book or employ yourself usefully. For the last hour you have not spoken one word, but taken the lid off that kettle and put it on again. Are you not ashamed of spending your time in this way?" At the age of 15 his active mind was busy, investigating the properties of steam—the expansive power of steam.

This little anecdote, be it fact or fiction, is still illustrated in elementary Scottish school history books, the picture showing James Watt as a boy intently watching the kettle of boiling water and pondering the uncanny power of steam that could lift the heavy lid off the iron kettle.

But it was the association with

like-minded young men on the staff of the University that stimulated that faculty of enquiry to some purpose. The students in the University shared also in the honor of being admitted to the intimacy of Watt and his shop. The place became a sort of an academy whither all the learned of Glasgow resorted to discuss points of the greatest nicety in art, science and literature.

His success in life may be attributed to a technological sense, a shrewd idea of the importance of the economy in fuel consumption resulting from the application of his invention—and to the partnership he formed with a Birmingham man. It was twenty years before he could see that his engine would bring him anything but disappointment and loss, yet he persevered.

He was a quiet, kindly, and gentle soul. He hated controversy. He much preferred wrestling with refractory machinery to fighting over the terms of a contract.

Sir Walter Scott spoke of him as the "alert, kind benevolent old man, his talents and fancy overflowing on every subject, with his attention alive to everyone's question, his information at everyone's command." I have spoken of his association with that great University of Glasgow and the inspiration he received from staff and student. It has been said that a close combination of genius, scientific study, and mechanical ingenuity were blended in this one man. His was an invention marking the start of an epoch in the history of the world and mankind. We have traveled a long way since the design to use the expansive force of steam became a realization, and great changes have swept across the life and thought of mankind since James Watt's discovery in 1782. James Watt began a new chapter of history and that at a time of manifest need.

We of Scottish descent take pride in, and give thanks for that Scotsman, who accomplished the greatest and most significant work performed by any engineer of modern times.

It has been a great privilege and honor to stand here today as a born Scotsman representing a Scottish Society to speak of another Scot.

[An address at Franklin Institute, Philadelphia, Jan. 21, 1936, on the occasion of the James Watt Bicentenary, under the auspices of the American Newcomen Society.]

Tested by Stranding

Welded Piping Remains Intact as Ship is Pounded on Reef

Another chapter recording the ability of oxwelded piping to withstand unforeseen stresses was written last September when the steamship Dixie was driven on French Reef off the coast of Florida by a storm of hurricane force.

Placed in service in January, 1928, Dixie was the first American ship to use high pressure, superheated steam, as well as the first to use welded piping. The welded high pressure piping had already given nearly eight years of trouble-free service when it was called upon to resist the terrific stresses imposed as the ship was pounded on the reef day after day. Some idea of the magnitude of these stresses is indicated by the fact that the boilers and turbines were pushed up nearly a foot above their normal positions.

After having been on the reef for seventeen days, the vessel was finally floated off and brought to New York in tow. Here inspection showed that the piping had remained intact; every weld had held. As part of the extensive reconditioning operations, the high pressure piping was again given a most critical inspection. It was not found necessary to replace a single weld.

In spite of the fact that the reconditioning of this vessel was the largest job of its type to be undertaken on either the Pacific or Atlantic coasts during the past five years, the work was completed ahead of schedule and on December 11 Dixie resumed her regular run between New York and New Orleans.

In view of this remarkable record, some further data concerning this ship and her power plant are of interest.

Dixie is a combination passenger and cargo ship, built in 1927 for the Southern Pacific Steamship Company, from designs prepared by their superintending engineer, Mr. A. S.

Hebble. The overall length is 445 feet; molded beam, 60 feet; displacement, 12,160 tons; gross tonnage, 8,100; designed speed, 15¾ knots.

Four oil-burning watertube boilers, operating under forced draft with preheated air, supply steam at 350 pounds per square inch and 200 degrees Fahrenheit superheat (total temperature, 636 degrees Fahrenheit).

The propelling machinery consists of a single screw driven by one set of De Laval compound turbines (one high pressure and one low pressure) connected through flexible couplings to double reduction gears. The slow speed gear shaft is directly coupled to the line shafting. The astern turbines are arranged in the exhaust ends of both ahead turbines. The turbines are designed to operate with steam 330 pounds gauge pressure and 200 degrees Fahrenheit superheat (total temperature, 630 degrees Fahrenheit) at the high pressure ahead and astern nozzles. The normal rated capacity of the turbines at turbine rotor speed of 3,250 revolutions per minute and propeller speed 91 revolutions per minute is 7,100 shaft horsepower.

Main steam piping is 8-inch diameter. All piping, flanges, and valves were made to withstand 1,400 pounds per square inch test pressure. All of the auxiliary piping and machinery was designed to take full boiler pressure so as to provide against possible admission of high pressure steam.

All joints in the high pressure piping systems are of special design. Long hub, high pressure, flanges were threaded back from the face for a distance equal to the flange thickness exclusive of the hub. The ends of the pipe were threaded to correspond and in addition were machined to give a tight fit in the flange hub. The end of the flange hub was then oxy-acetylene welded to the outer wall of the pipe. This work was done by welding operators qualified in accordance with Linde Procedure Control.

The high pressure systems include piping for steam or hot oil, designed for 400 pounds working pressure and 750 degrees Fahrenheit total temperature; feed lines (non shock hydraulic), designed for 500 pounds working pressure and 450 degrees Fahrenheit total temperature; and air or gas, designed for 750 lbs. working pressure and 100 degrees Fahrenheit total temperature.

As mentioned above, Dixie was the first steamship to use welding for high pressure, high temperature service. The fact that all welds have remained completely trouble - free throughout a long period of service, supplemented by the terrific, unanticipated stresses of the hurricane experience, furnishes another convincing proof of the reliability of this method of construction.

Marine Experts to Discuss Safety of Life at Sea

The subject of Safety of Life at Sea, which has grown in international importance during the past few years, will be the main topic of discussion when between 200 and 500 marine experts from all parts of the world convene in New York during the week of September 14 to 19 inclusive. This International Meeting of Naval Architects and Marine Engineers, the first to be held in this country, is being sponsored by the Society of Naval Architects and Marine Engineers, 29 West 39th Street, New York.

While complete arrangements have not yet been made, it is expected that ten papers will be read and discussed. Representing the Institute of Naval Architects, North East Coast Institution of Engineers and Shipbuilders, the Institute of Marine Engineers, and the Institution of Engineers and Shipbuilders in Scotland, all of Great Britain, Dr. J. Montgomerie will present a paper entitled, "Some Aspects to Safety of Life at Sea," while E. L. Champness, M. Sc., will present a paper entitled, "Prevention of Fires at Sea."

The French society, Association Technique Maritime et Aeronautique will be represented by two papers entitled, "The Normandie," by Messrs. Romano and Conard, and "Safety of Life at Sea," by Mr. Berhle de Berhle. "The Rolling of the S.S. Conte Di Savoia in Tank Experiments and Sea Courses," by Drs. Ing. Renato de Sanctis and Michele Russo, of the Italian society, Vasca Nazionale per le Esperienze di Architettura Navale, will be the Italian contribution to the session.

Dr. Gunther Kempf, representing the German society, Schiffbautechnische Gesellschaft, will present a paper entitled, "Propulsive Qualities of Ships," while Dr. Ing. E. Foerster, representing Gelsellschaft der Freunde un Forderer der Hamburgischen Schiffbau - Versuchsanstalt, will present a paper entitled, "Relation between Ships Sizes, Possible Power and Maximum Speed."

Representing the Sosen Kiokai of Japan, Mr. Shozo Ikushima will present a paper entitled, "Observations on Actual Application of Safety and Loadline Conventions."

From the United States, Rear Admiral J. G. Tawresey, (CC) U.S.N., will discuss "The Safety of Life at Sea," while Mr. E. H. Rigg, Naval Architect of the New York Shipbuilding Company, will present a paper, "Modern Transatlantic Liners." Both Admiral Tawresey and Mr. Rigg are members of the Society of Naval Architects and Marine Engineers.

Social events will be interspersed with the technical sessions and will be marked by a reception by Rear Admiral George H. Rock, President of the Society of Naval Architects and Marine Engineers, to be held on Monday, Sept. 14 at the Webb Institute of Naval Architecture in New York City. Other social events will include a banquet to be held on Tuesday evening, September 15, a trip up the Hudson to West Point, New York, on Thursday, September 17, a visit to Newport News, Va., where the Newport News Shipbuilding & Dry Dock Company, Mariners Museum, Langley Field, Williamsburg, Jamestown and Yorktown will be inspected on Friday, September 18, and a visit to Washington, D.C., on Saturday, September 19. Arrangements are being made by a committee of which Captain Roger Williams, vice-president of the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., is chairman.

Safe Navigation by Wireless

One of the greatest contributions to safety at sea in an emergency is radio communication by which a ship can be in instant and constant touch with shore stations and with other ships. Perhaps of even greater importance to safety at sea is that other contribution of radio—the Radio Direction Finder—in that it insures safe navigation in fog, the sea travellers' worst enemy.

The United States Lighthouse Service Bulletin for February carries an excellent article, setting forth the present development of the radio direction finder and its use on lighthouse tenders and other floating equipment of the service.

Because this article gives such a comprehensive survey of very recent developments, we reproduce it in full as follows:

The importance of radio-direction finders as navigating instruments is indicated by the fact that between 5,000 and 6,000 ships are now equipped with them. Radio direction finders came into general use by all mariners, particularly on large ships, between 1925 and 1928. In 1935 marine underwriters are reported to have announced reduced premiums for certain vessels equipped with direction finders. This attributes great importance to these instruments as it is most unusual for underwriters to reduce premiums in respect of any specific aid to navigation, preferring to let such aids win their own reward eventually by reducing claims.

Many are used on lighthouse tenders and some on lightships. The first radio direction finders in the Lighthouse Service were installed on the Tulip and Arbutus in 1917 and 1919, respectively. Their successful use on lightships is a recent innovation made possible through the availability of improved instruments suitable for such exposed service, and the equipping of small tenders has been justified by the extension of the radiobeacon system. Lightship direction finders are used not only in proceeding to and from station, but more particularly in checking station position and for monitoring observations and study of important shore rabiobeacons in the area.

During the last year or two, several interesting new developments have taken place:

First, manufacturers have recently perfected and sold considerable numbers of low-cost instruments to small ships, yachts, and pleasure boats.

Second, manufacturers have offered a wide range of improved models. There were few improvements offered in radio direction finders from 1925 until about 1934-35. The new models now available can be had at prices considerably less than that charged for the original, less satisfactory types. This reduction in comparative cost of equipment is extending their use. Some of the most popular new offerings have the handwheel, receiver and indicator assembly suspended from overhead instead of using a bulky floor-mounted binnacle, although the latter is still used for the more elaborate models such as those equipped with gyrocompass repeater cards. Most evident in the new improvements are the reduction of space required, the ease of handling, vertical wheel and card for improved visibility, reduction of electrical interference, greater range, and better selectivity. Many older installations are still in good mechanical condition, but there is need for a modern radio receiver for these old installations to provide selectivity permitting proper use of the many radio beacons now operating in the radiobeacon frequency band.

Third, a new positively indicating uni-directional instrument has been developed by several organizations and although not sold to the marine public, a number are in use in the New England—Atlantic—area principally on fishing vessels and other small craft. These are rented as an adjunct to radio-telephone service, and cannot be purchased separately at present. Similar instruments have received considerable publicity when used on aircraft for navigation off the radio-range served airways. This instrument should not be confused with attempts made to attach meters or lights to ordinary aural direction finders, as it does not operate on a minimum signal but on a rapidly alternated quasi-maximum. Its chief advantages are greatly increased range, positive sense indication, and visual indicating meter. Its range is about three times that of aural types and it is reputed to cost about the same as the similar class of aural equipments.

Fourth, European developments quite different from ours are being sold. One is a radio direction finder which takes its own bearings and follows the radiobeacon position. The user simply tunes in the radiobeacon signal and instantly a dial indicates the bearing. It furnishes accurate and continuous bearings as the ship moves, permitting navigation by watching the bearing continuously. Bearings register in a few seconds. The device contains a motor-driven loop rotated several hundred revolutions per minute and is entirely different in principle from United States products.

Fifth, an important development which has been principally contributed by Great Britain research workers, is the cathode ray direction finder. Some experimental work has been carried out in the United States also, but so far as is known, no commercial models have been constructed and sold to mariners. The results of research to date indicate many possibilities for this type of instrument. Such direction finders have been constructed and tested and found to be capable of furnishing accurate visual bearings on a radiobeacon signal of only a fraction of a second in duration. Also, such instruments have been found capable of definitely discriminating between "night effect" errors and the correct signal.

Much promising progress has been made, and the next few years doubtless will witness major developments in the art of direction finding. Meanwhile, the mariner has available a variety of direction finders which will enable him to navigate accurately and surely regardless of vision, when used to observe the characteristic signals of radiobeacons established on lightships and at light stations.

The Modern Ship and Her Equipment From the Shipowner's Viewpoint

Part II—*Auxiliary Machinery*

By L. L. Westling

The various types of power equipment are well known to those engaged in the several branches of engineering, whether in the transportation field or in stationary practice. The general use of such apparatus is the same afloat as it is shoreside, but due to certain physical and economic limitations the marine application is peculiar to that service.

The types of main propulsion machinery have also become rather standardized, but the designer of ship power plants has many factors to consider in his choice, including the weighing of the owner's oftimes fixed opinion in the matter. The choice of main machinery is the greatest influencing factor in the choice of auxiliary machinery.

The power supply to the auxiliaries is practically a choice between steam actuated units and electrically driven units. The matter of the use of the diesel engine aboard ships has proved to be a very controversial subject in America, and so far, our shipowner has not become very enthusiastic about its general application. He has seemed rather attached to the various forms of steam power plants for larger vessels. When the diesel is used, the power distribution to auxiliaries is naturally by means of generators and motors.

The American Merchant Marine had a very lethargic development between the Civil War and the World War. It was not until we experienced a most embarrassing situation relative to wartime transportation that the American again became shipminded, but since then, through trial and costly error we have taken on life anew, and have made some valuable contributions to the art, along conservative lines.

The merchant ship in its final analysis is an instrument of profit to the owners. The American shipowner has been a practical business man and the development of his ships and their component parts has been along practical lines. The design and development of auxiliary machinery has kept pace with that policy.

The normal life of marine equipment is much shorter than that of the stationary plant. Its accelerated depreciation is due to the heavy toll of corrosion and erosion met in ocean going service. Sea water, carrying high amounts of entrained air, makes for short life of equipment. The compactness of arrangement and the conservation of space and weight, coupled with the high and incalculable stresses that are encountered in a seaway, are factors that are not conducive to long life.

High engineering efficiencies usually accompany the arrangement which is not limited by dimension. This is particularly noticeable in the comparison of boiler furnaces afloat and those ashore. Space on board ship is very costly and must be conserved, and the vertical dimension often cramps the style of the designer because of stability factors. It is necessary for the engineer to make a proper balance between the desired economies to be affected and the reservation of space for the benefit of revenue in carrying volume and weight of cargo.

Variations in power plant load also affect the choice of marine auxiliary units. Sudden and extreme changes are met in the operation of tug boats and ferry boats. Two other extremes are found on merchant and naval vessels while in port or at sea. Auxiliaries must be chosen which will provide good efficiencies under these varied conditions.

The weighing of all these factors governs the design of the marine power plant.

The shipowner and designer are well aware of the advantages of high pressures and high temperatures in the use of steam and are striving to put to use such sources of economy. Retarding factors, however, make themselves felt in terms of weight of equipment and space required to adopt them. The relatively cramped condition of the marine power plant makes it difficult to accommodate reheating equipment, multiple stage feed heating, economizers, and the usual long radius bends for high pressure and high temperature piping. The rigidity resulting from this crowding, together with the movement of the vessel's structure in a seaway, must be considered. Much experimental work is being done, principally by the Germans, in this field, and characteristically we Americans are cautious, and—for the moment—have accepted pressures of 500 pounds and temperatures of 750 degrees as practical limits for merchant service.

High pressures, however, have restricted the use of certain auxiliaries to which the ship operator has long been attached. The old faithful reciprocating steam unit has now been displaced by the more satisfactory high speed turbine unit, and it is now standing by for emergency service, or for units infrequently used.

For these services, lower pressure is obtained by the pressure reducing valve, and low temperatures are provided by submerged convection spray type of desuperheater equipment.

Pumping equipment in general is of the centrifugal type, with stages according to the pressure conditions required. Most marine service pumps must meet a wide range of capacities, the load varying in the different service conditions under which the vessel operates.

The power plant designer is inclined to be very conservative in choice of such equipment, allowing large capacities for a given service and specifying standby capacity.

When a vessel is at sea she is a long way from repair shops. It is therefore the rule to provide 100 per cent standby units for all vital auxiliaries, thus insuring the safety of the vessel as well as providing adequate protection of both vessel and cargo against fire, leakage, or loss of perishables through failure of refrigeration. All main power plant auxiliaries such as air ejectors, condensate pumps, or boiler feed pumps are installed in duplicate. Connections are made with other auxiliaries that will afford emergency service.

The most important system upon which the power plant depends is the feed system, and its application is rather standardized. The condensate from the condensers is lifted by the condensate pumps and discharges through the inter-and-after coolers of the air ejectors to the hot well for the first stage heater. On smaller plants the condensate is thus returned to the hot well tank, from which the feed pump takes its suction. On the larger plants the condensate passes through the first stage heater, which in the past has been the enclosed coil type, but the new order is for de-aerating heaters of the direct contact type. The source of heat for this apparatus is the exhaust steam from various engine-room, steam driven, auxiliaries, the pressure being maintained at approximately 10 pounds gage.

The feed pump takes its suction from this heater and discharges the water to the main feed line, through a second stage heater which is of the enclosed coil type and which is supplied with steam bled from a suitable stage of the main turbines. In port, when the main engines are not operating, the second stage feed heater is by-passed.

The main feed pump is generally turbine-driven, and is the most satisfactory source of exhaust steam for first stage heating. When three-stage heating is used, a booster pump is generally added to the system. The emergency feed pump is always a reciprocating unit, usually a simplex type.

The main circulator for the propelling unit is always of the centrifugal or impeller type, taking its suction from the sea. It is generally driven by a steam unit which also assists in heating the feed water at the first stage heater. There are a few installations of motor driven circulators, but usually the heat balance requires that it be steam driven, preferably by a turbine.

For port service an auxiliary condenser is installed, which on the more modern vessels, condenses the steam from the electric generator turbines at a high vacuum. It also serves all deck machinery, such as cargo hoists. The engine room auxiliaries continue to exhaust at a back pressure of approximately 10 pounds, the pressure being maintained by a spring-loaded back pressure valve, the excess quantities passing to the condenser. The condensate handling is similar to that of the main unit.

Other pumping services include sea water sanitary systems, fire line systems, services for hot and cold wash water, culinary water, bilge water, sea water ballast, lubricating oil, fuel oil storage and transfer, and fuel oil burner systems. Most of these units are of the centrifugal type, except the oil handling pumps, which are frequently of the rotary or screw type.

A most important unit is the electric generator. It may be diesel-engine driven, or steam-reciprocating-engine driven, but the general rule of modern American merchant vessels is turbine drive with reduction gearing. The generator almost always is of the direct current type.

There are a few naval installations in which the alternating current generator is being used, but their value is yet unproved. The requirements aboard a merchant vessel are such that the direct current is more desirable. The wide variation in pumping loads, and the flexibility of control required in cargo hoisting, make direct current desirable; while deck service such as anchor windlass and capstan, which may require high torque with stalled motors for perhaps fifteen minutes, makes the direct current service almost imperative. Obviously, the loss due to long distance transmission does not enter into the problem.

The current used aboard ship is generally distributed over a three-wire 230-115 volt system, the power and heavy heating circuits of 230 volts and the lighting and miscellaneous small motors using 115 volts.

Other conditions which favor direct current usage are the ease of paralleling the output of two or more generators, and the simplicity of the apparatus usually companion to direct current. Also the average seagoing engineer is not yet familiar with alternating current equipment.

There are several vessels in service on which the generators are mounted on the extended shaft of the high speed pinion of the main propelling reduction gearing, the theory being that a saving would be effected due to the better water rate of the larger turbine. In practice, however, the overall saving is relatively small, partly because it is found advisable to have an auxiliary unit floating on the line to take up emergency duty. Should orders from the bridge suddenly demand a change of main engine speed or reversal, an automatic means must be provided to transfer the load to prevent the stoppage of very vital motor-driven auxiliaries.

Turbines and high pressure steam have brought aboard new and magnified problems to the operating engineer. The greatest fear that the marine engineer harbors is the contamination of the boiler water with sea water. There are several places where the steam or condensate comes in close contact with the sea water. The main and auxiliary condensers which circulate sea water are the principal offenders. Condenser tubes are vulnerable to the corrosive and erosive effects of sea water which has large quantities of air entrained. There are losses, due to electrolysis sometimes, and occasionally due to vibration. The sea water contamination in the boiler is serious. It is the usual practice to test the condensate frequently, and most of the larger vessels are equipped with a continuous sampling device which gives visible and audible alarm when there are salts present. The problem of the proper choice of condenser tubes is a hard one for the shore staff to solve.

To keep down the concentrations of the boiler water, the high pressure plants use evaporators for the distilling of the fresh water that they carry in their tanks and which is taken in port. These evaporators are usually supplied by steam bled from the main turbines. On lower pressure steam plants, which do not require distilled water for makeup feed, they are faced with the problem of keeping proper ratios to prevent the caustic embrittlement of boiler drums. Great care must be exercised in the choice of ports where boiler water may be taken.

Heat exchange equipment used aboard ship has its parallel shoreside, and includes fuel oil heating for boiler use, lubricating oil cooling, and fresh water heating for wash and culinary purposes.

Steam pressure requirements aboard ship are various, and the higher the boiler pressure the greater the number of requirements. We have found that certain auxiliaries operate best with steam at boiler pressure and high superheat, while others require medium pressure and low superheat. Heating of quarters and culinary service require low pressure and saturated steam. A vessel with the boilers operating at, say, 450 pounds per square inch will require steam at pressures of 450, 250, 150, 70, 35, 10 and sometimes 5 pounds—the pressure conditions being produced by a series of reducing pressure valves and by the bleeding of steam from the main or generator turbines.

The present tendency for deck machinery is toward the electrically driven machine which produces excellent economies as compared with the usual steam unit, such as represented in the two-cylinder steam hoist with the 90-degree eccentric required for simple reverse gear.

The cargo cycle used in some places is difficult but not impossible for the electric hoist to meet. The flexibility of the steam hoist and the cost of the equivalent in electric control apparatus has made the ship operator slow to accept the new form. The steam hoist provides an extreme variation in steam requirements. On a vessel now being developed, the large number of steam hoists indicates a port load of approximately 45,000 pounds of steam per hour at a pressure of 200 pounds and a superheat of 40 degrees, while the same boilers must deliver at sea approximately 63,000 pounds at 450 pounds pressure and 300 degrees of superheat. Obviously, the heat balance problem in the machinery spaces is relatively intricate.

The types of vessels and the services in which they are employed seem almost endless in number. The design of the plant and its auxiliary arrangement is equally as varied. It is not possible that all schemes and all services can be adequately covered in a single treatise but the subject and the problems met have been shown in a general manner.

Sperry Gyro-Compass and Metal Mike for Queen Mary

The giant Cunard White Star super-liner Queen Mary will be equipped with Gyro-Compass, Gyro-Pilot, and High Intensity Arc Searchlights manufactured by the Sperry Gyroscope Company.

The Gyro-Compass, while an adaptation of a toy known for a hundred years or more, is a rugged, finely built device which utilizes two of the strongest natural forces, rotation of the earth and gravity, to obtain its true-north direction-finding ability. Unlike the magnetic compass, its indications are uninfluenced by magnetic attraction, variation, heeling error or dip. Since 1911 many hundreds of merchant marine and naval vessels have adopted the Sperry Gyro-Compass. The Cunard White Star Line have really shared in this development, for seventeen years ago the Aquitania, of the Cunard Line, made navigational history when she steamed past Fire Island lightship, the first merchant vessel to arrive in New York equipped with a Sperry Gyro-Compass. Other installations rapidly followed, and soon the Olympic, Homeric, Mauretania, Berengaria, and many others were steering "true" courses across the Atlantic. The Gyro-Compass is housed below decks and thoroughly protected from weather, its true north indications being electrically transmitted to the Gyro-Pilot, the Course Recorder, Steering and Bearing Repeaters in much the same manner that a master clock transmits the time to many repeater clocks throughout a hotel or factory.

The Gyro-Pilot, or "Metal Mike" as it is called by seafaring men the world over, takes a commanding position in the wheelhouse where it performs a dual role. When connected to the Gyro-Compass, it becomes an automatic helmsman, thereby providing economical, untiring fuel-and-time-saving steering control. The slightest departure from the prescribed course is detected, and the mechanism immediately swings into action to move the rudder just the required amount to return the vessel to her course. A graphic picture of every movement of the ship from dock to dock is recorded on the automatic log, the Sperry Course Recorder. When at times the automatic feature of the Sperry Gyro-Pilot is not desired, a turn of a switch provides a simple, accurate electric control of the steering engine paralleling the hydraulic telemotor all the way to the steering engine room aft. Since the Sperry Gyro-Pilot made its debut in 1922, it has been adopted by more than four hundred merchant marine vessels of many types.

Above the wheelhouse are mounted two Sperry 18-inch High Intensity Arc Searchlights. Considering their size these searchlights are extremely light in weight, being constructed almost entirely of duraluminum.

New Welding Electrode

An entirely new field of welding is opened up by a phosphor bronze arc welding electrode just announced by the Lincoln Electric Company, Cleveland, Ohio.

"Aerisweld," as the new electrode is called, is the result of many years of research and experiment. Thoroughly tested in the practical welding of bronze, brass and copper in many applications, this electrode provides a solid homogeneous deposit, having characteristics of true phosphor bronze with notably high tensile strength.

The high quality weld metal produced by the electrode makes it ideal for fabricating new products or reclaiming old ones of bronze, brass or copper. A few of the many applications include:

Busbars, large contacts, impeller

blades in pumps and turbines, ornamental bronze, and bronze doors. Many types of bronzes which are exceedingly difficult to braze, are readily welded as are also galvanized sheets, where minimum disturbance of the galvanizing is essential.

In reclamation of worn parts of equipment, "Aerisweld" is used to build up and fill in bronze castings such as journal boxes and containers, bronze valve seats, or bronze bearing surfaces on steel or cast iron.

"Aerisweld" is a shielded arc electrode, for use with the metallic arc. Its coating, as it burns, produces a gas which shields the molten metal from harmful effects of the atmosphere and assists in easing the flow of molten metal in the arc.

In using "Aerisweld," welding current of positive polarity is employed on the electrode. Preheating of the parts is unnecessary when welding any ferrous metal and the lighter grades of copper and bronze. Where heavy bronze or copper is to be welded, some preheating may be desirable due to the high heat conductivity of these metals. In such cases, preheating is easily accomplished by using a carbon electrode with the negative polarity and rapidly moving the arc over the area to be welded. For cast iron, low current is used since excessive heat is detrimental to satisfactory welding of this metal.

"Aerisweld" electrode is made in two sizes, 5/32 inch and 3/16 inch, 14-inch lengths and comes packed in standard containers of 5 pounds net each size.

Marsh Universal Socket Dial Thermometers

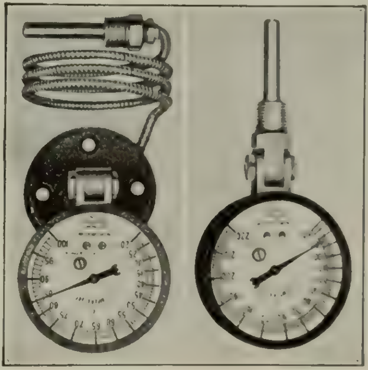
An interesting standardized Universal Socket Dial Thermometer in both the self-contained type and in the distant reading type has recently been introduced by the Jas. P. Marsh Corporation of Chicago.

The Type 61 self-contained instrument fitted with the Marsh Universal socket permits the use of the one instrument as a vertical connection thermometer, a 90 degree back angle thermometer, a front angle thermometer or any intermediate angle. It eliminates the requirement of specifying a specific type of stem for each particular application. This permits the dealer or the user to apply a single instrument of a given range to practically any installation.

The type 62 distant reading thermometer is standard with six feet of connecting tubing and a union bulb or, in the case of high temperature thermometers, either a union bulb or a flexible plain bulb. The thermometer has a mounting flange together with the universal socket which permits the installation of the instrument proper at any convenient point on top or in front of the apparatus or on a wall or pillar.

Fahrenheit scale ranges for all requirements from 20 degrees below zero up to 800 degrees above zero or corresponding centigrade scales are available.

The graduation arc on the dial of these instruments and the distance traveled by the pointer is equivalent to approximately the operating scale length found on most 9-inch scale size industrial thermometers of the glass tube type. The type of graduation, numerals employed, and pointer type indication, make this instrument legible and easily read at much greater distances than is the case with the glass tube type of thermometers.



The instrument is manufactured in 3½-inch dial size only. Standard finishes include black crystal all-over, black crystal with nickel plated trim, polished brass all-over or nickel plate all-over. On special order chrome plate all over finish is available.

A wide variety of bulbs can be furnished for various applications.

Flexibility of installation, legibility, and standard accuracy of these instruments should make them very acceptable in many applications aboard ship.

Trade Literature

Non-Sparking Tool Catalog. The Superheater Company of New York and Chicago recently issued catalog 20,001-1 on Elesco non-sparking tools.

The use of these tools will prevent the emission of sparks, with attendant fire or explosion, where there are inflammable or explosive gases. Special hardening alloys are incorporated in the cutting tools.

Book Review

NEW STUDIES OF SHIP MOTION by P. R. Bassett and F. P. Hodgkinson. During the three years experience of the Sperry Gyro-Stabilizer on the Italian liner Conte di Savoia, a great deal of study has been made of the rolling, heeling, and yawing motions in a seaway of that large fast vessel. Much data has been gathered and experience gained. This data and experience is here analyzed for the benefit of the ship designer and suggestion made for certain basic changes in design of new ships. This paper also will be more fully abstracted together with discussion in a forthcoming issue.

Marine Insurance Review

Safety Work in the Shipyard

By A. Albert Giese

Staff Supervisor, Personnel Division, Newport News Shipbuilding & Drydock Co., Newport News, Va.

The shipbuilding industry is making progress in its safety work. Records kept by six major shipyards, eight large repair yards, and ten navy yards prove this. Their combined accident frequency rate was reduced from 22.6 lost time accidents per million man-hours worked in 1931 to 10.6 in 1934. The severity rate came down from 2.40 in 1931 to 1.30 in 1934. These yards, which probably will show well over one hundred million man-hours worked for the twelve months of the present year, had a combined frequency rate of 9.4 for the first four months of 1935. In the case of our own yard at Newport News, the accident frequency rate has geen gradually reduced from 24.0 in 1927 to 9.1 in 1934. The 10.6 frequency rate in 1934 for the group of shipyards just mentioned compares very favorably with 10.8 for the steel industry for the same year, with 31.9 for all construction work in the country during the same year, and 15.3 for all United States industries.

It happens that the accident frequency of 24.0 in our yard for 1927 is about the same as the present rate for all industries in Virginia. We are self-insurers under the Workman's Compensation Laws in our state; therefore, we have been able to realize directly on all savings which have been made by reducing our accident rate. In the sixteen years which have elapsed since enactment of the Workman's Compensation Law we have saved approximately $1,500,000 by being self-insurers. This is not an argument against the casualty insurance companies. They are necessary and their premium rates must be governed by the average accident experience of a large group of employers. Accordingly their charges must be based on an accident expectancy much higher than actually obtains in some individual instances, such as our own.

### ● Shipbuilding Hazards

The building of ships, particularly large ocean-going merchant vessels and warships, presents practically every accident hazard imaginable in modern industry. Safe working conditions are frequently complicated by the necessity for several trades to work at the same time in small congested spaces where each is subject to the occupational hazards created by the others. The extensive use of stages and scaffolds offers numerous opportunities for accidents.

The industry comprises, in the ultimate analysis, about twenty distinct trades, which, if broken into their component parts, would represent about one hundred separate, distinct kinds of jobs done by men with their hands.

Repair work on ships in dry dock and afloat is inherently hazardous yet it must be expedited, whether below deck, on deck, or overboard, and in all kinds of weather.

Extensive use of electric welding in ship construction offers certain hazards which must be met. Injuries to eyes from electric flashes and inhalation of noxious gases are the principal dangers here.

● Safeguards in Shipyards.

There is comparatively little opportunity for standardization in shipbuilding, nor can safety work in a shipyard be standardized except in few instances. Where working conditions change from day to day, the accident hazards vary with the work.

Mechanical devices are used to protect workmen wherever they can be applied effectively; however, their application and usefulness in a large shipyard is limited. Guards can be used on certain types of machine equipment and are, if used faithfully, very satisfactory. Guard rails find a wide variety of uses both in the shops and on the ships. Because they are usually of a very temporary nature, guard rails installed on ships under construction must not have too much dependence placed on them.

The safety device of greatest single value in a shipyard is probably the goggle. Our experience as regards eye injuries has been steadily improving during the past five years. In 1930 there was an improvement of 15 per cent over 1929; 1931 improved 20 per cent over 1930, 1932 improved 5 per cent over 1931; the 1933 record was 14 per cent better than that of 1932; and in 1934 we showed an improvement of 9 per cent over 1933.

It would be difficult to enumerate all the safety devices which have some use in a shipyard. The use of standard and special safety equipment has its place in our safety program. So does the wide display of safety posters and bulletins. But if we were to stop here it is doubtful that our accident frequency would ever be much under the 24.0 index we experienced in 1927.

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● **Safe Working Habits.**

The formation of safe habits by workmen is, to our certain knowledge, the surest way to reduce accidents in a shipyard. We find that job training, whether in the skilled, semi-skilled or unskilled classes, is a prerequisite to real safety. In our own case the training of skilled workers is a function of the training department. The training of semi-skilled workers is the dual responsibility of the training department and the supervisory staffs of the several yard departments. The responsibility for carefully selecting replacements belongs to the employment department.

Regardless of how an individual finds his way to a given job, the final responsibility for his safety while on that job is placed on his immediate supervisor. Full time safety inspectors and plant watchmen are helpful in detecting unsafe conditions and practices, but their presence and duties do not in any way lessen the responsibility of the supervisors where the safety of workmen is concerned. Of first and equal importance in a shipyard safety program, we do not hesitate to place, selection and training of personnel, and fixing of responsibility for preventing accidents upon supervisors immediately in charge of the work.

No one familiar with shipbuilding would admit the possibility of completely eliminating accidental injuries in a shipyard. It just isn't that kind of work. In our yard the term "accident" covers everything from pin scratches to fatalities. We have a rigid rule that employees injured in any way while at work must report at once to our medical department for treatment.

Medical attention is provided for all employees while at work. A fully equipped clinic and competent medical staff is maintained on the shipyard premises. Our medical department has been certified by the American College of Surgeons as complying with the standards of that body for medical service in industry. This department can be described as a small emergency hospital and a first-aid station. The main clinic contains a large dressing room, an X-ray room and dark room, an operating room, a small three-bed ward, a physiotherapy treatment room, a dressing room for screened cases, doctors' offices, an examination room, a waiting room, and a supply room. Removed from the main clinic and near the building ways we have a fully equipped first-aid station, provided primarily to save the time of employees working at a distance from the main clinic, and to encourage the reporting of the most minor injuries.

All applicants for employment are sent to the main clinic for a thorough medical examination before they are allowed to go to work. Temporary defects are often found which must be corrected before they can be employed. Complete records are kept of all accident cases and all pre-employment examinations. These histories permit an efficient follow-up system in cases where patients must return for re-treatments and are very valuable for statistical purposes.

The staff of our medical department consists of two part-time surgeons, five registered white female nurses, a stenographer, and two colored orderlies. The fact that less than 2 per cent of all injuries occurring in our yard result in the injured employee losing time from work must be credited largely to this group and the fine services they render.

Marine Insurance Notes

New Safety Manual. The Union Oil Company, Los Angeles, California, has issued to its marine personnel, a very fine safety manual in two editions, one for the ocean-going tanker fleet, and the other for river and harbor craft. These manuals are made up largely of illustrations of right and wrong ways of doing things aboard ship, the text being confined to comment on the illustrations, with the exception of a safety message on the title page from William Groundwater, Director of Transportation, for the company.

The new manuals are almost entirely the work of Kyle J. Lutz, Safety Supervisor of Oleum Refinery, who spent many weeks at sea and in port working out the plans and taking the photographs of various marine activities.

Because of the many requests made for copies of the "Service Station Safety" pamphlet, the company has made a nominal price of fifty cents per copy for either edition.

George F. Prussing is the safety engineer of the marine department of the Union Oil Company.

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Marine Corrosion. Mr. William E. Lewis, special surveyor of steel for Lloyd's Register, read a masterly paper before the North-East Coast Institution of Engineers and Shipbuilders, giving a report of his research work on marine corrosion of ships' hulls. In his opinion, copper or copper with a very small proportion of chromium, was the only alloy element whose effect on the corrodibility of mild steel was worthy of consideration by shipbuilders on any economic basis.

The author submits that the most efficient method of inhibiting corrosion on the hulls of merchant vessels is thorough de-scaling of the steel before construction so as to ensure direct contact of the priming coat of paint with the metallic surface it is desired to protect. Impermeability of the protective paint is a prime consideration in corrosion prevention.

We are reminded by the conclusions of this paper that years ago it was more or less standard practice to launch steel vessels unpainted below the water line, so that the salt water might act somewhat like a pickling tank and thoroughly loosen all scale. On completion, the vessel would be dry docked, and given a thorough cleaning to remove all scale. Then, when the hull was perfectly dry, the priming coat would be applied, and over it the other coats. It is a matter of record that this method was very efficient, not only in preventing corrosion, but also in greatly increasing the effectiveness of anti-fouling compositions.

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INSURANCE
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New York Underwriters Elect. In January, at the annual meeting of the Board of Underwriters of New York City, the report of the nominating committee was unanimously adopted and the nominees elected as officers and directors for the ensuing term. Mr. Albert Ullman was re-elected president, and Mr. Hawley T. Chester vice-president. Mr. S. D. McComb, who had been serving as treasurer, was elected secretary; and Mr. William D. Winter, treasurer. Directors elected to serve till January, 1939, are Mr. Harold Jackson, Mr. E. J. Perrin, Jr., and Mr. W. C. Spelman.

Salina Cruz to Open. The Mexican port of Salina Cruz on the south shore of the Isthmus of Tehauntepec, formerly a bustling international port which was closed to sea-going ships in 1924 on account of the silting up of the harbor, is to be opened again during the current year. A presidential order directs dredging work to start immediately. The estimated cost is in excess of a million pesos. The opening of this port will be of great benefit to the entire southern end of Mexico.

Cargoes on Small Vessels. The Swedish Sailing Ship Association, whose membership comprises the owners of all small vessels flying the Swedish flag, held its annual meeting recently, and one of the topics uppermost in the thoughts of those attending was the high cost of cargo insurance for the small ship owner. This cost ranges to over five times that of insurance on similar cargo carried on large steamers. The members, therefore, considered the question of establishing a joint mutual insurance organization and appointed a committee which has made considerable progress in negotiating between the shipowners and the merchants and shippers concerned. A new policy form may be expected shortly to effectuate this mutual cooperative insurance.

Freights, Charters, Sales

March 23, 1936

We have the following fixtures to report:

GRAIN: British m.s. Jedmoor, British Columbia to U.K., by Anglo Canadian Shipping Co.; British stmr. Goolistan, Vancouver, B.C., to Avonmouth or London or Hull, March, Canadian Shipping Co.; British stmr. Haxby, British Columbia to U.K., March, Montreal Shipping Co.; British stmr. Geddington Court, British Columbia to U.K., March, Canadian Transport Co.; British stmr. Yearby, Vancouver, B.C., to Europe, March, 18/-; British stmr. Ardangorm, British Columbia to U.K., April; British stmr. Grainton, Vancouver, B.C., to Europe, 18/3, April; British stmr. Rajahstan, Vancouver, B.C., to Europe, April, 18/3, Montreal Shipping Co.

CORN: Uarpathian (new) River Plata to North Pacific, March, Louis Dreyfus & Co.

LUMBER: Norwegian m.s. Brand, Coos Bay and Columbia River to Shanghai and Nanpoo, lumber and logs, March, Dant & Russell; British stmr. Quebec City, British Columbia to China, lump sum, April; British stmrs. Anglo Peruvian and Ousebridge and Norwegian m.s. Austvard, British Columbia to Shanghai, March, Ocean Shipping Co.; British stmr. Artemisia, Columbia River to 4 ports Japan, lump sum, £5,000, f.i.o., April, Anglo Canadian Shipping Co.; Swedish m.s. Fermia, North Pacific to Japan, lump sum, £3500, f.i.o., March; British stmr. Hartlebury, Columbia River to 4 ports Japan, lump sum £4650, f.i.o., March; British stmr. Harbledown, British Columbia to Shanghai, lump sum, £4800, f.i.o., April; British stmr. Harborough, British Columbia to 4 ports Japan, lump sum, £4800, April; Greek stmr. Rokos, North Pacific to 4 ports Japan, lump sum, £4500, f.i.o., March; British stmr. Start Point, North Pacific to Australia, option China, f.i.o., April/May; British m.s. Ary Lensen, British Columbia to Albany and New York, March, Anglo Canadian Shipping Co.; British m.s. Dallington Court, British Columbia to Japan, March, Canadian Transport Co.; British stmr. Dalcross, British Columbia to Australia, March Canadian Transport Co.; British stmr. Janeta, British Columbia to Sydney, March; British m.s. King Edgar, British Columbia to Australia, March/April, B. C. Shipping Agencies; British stmr. Bradfyne, British Columbia to Shanghai, April, Ocean Shipping Co.; British stmr. Uffington Court, British Columbia to Nanking and Hankow, April, Ocean Shipping Co.; British stmr. Sinnington Court, Columbia River to Orient, March/April, Canadian Transport Co.; British m.s. Vancouver City, Coos Bay and Columbia River to Shanghai and Nanking, April, Dant

(Page 144, Please)

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BUILDING

Progress of Construction

The following Report Contains all the Data Available Concerning the Shipbuilding Work in Progress at the Leading Shipyards of the United States as of March 1, 1936

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: Order placed for **DD400** and **DD401**, two 1500-ton destroyers for U. S. Navy; no dates set.

FELLOWS AND STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Hull No. 647, Fellows Craft Universal**, L.B.P. 35', beam 11', draft 4'6", sail area, 450 sq. ft., sloop rig; engines twin 30 horsepower, universal flexifour; keel laid November 25, 1935; estimated delivery March, 1936; 95 per cent complete March 15, 1936.

Auxiliary cutter for R. S. Cooper, Burbank, Calif.; L.B.P. 43'3"; beam 12'0"; draft 6'5"; length water line 31'9"; sail area 1061 sq. ft.; motor Kermath Sea Bird; 30 h.p. motor with 2 to 1 reduction gear; propellers 3-blade Hyde feathering; keel laid Feb. 17, 1936; delivery estimated 90 days; designer John J. Alden, Boston, Mass.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

Plant closed due to labor conditions.

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Lurline, S.S. Steel Scientist, S.S. Makiki, S.S. Maui.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

No work Employees on strike.

THE MOORE DRYDOCK CO.
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: Vessels tied up at plant—no work performed.

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: Canadian National Steamship Prince Rupert, annual overhaul commenced. Two fishing boats, docked, cleaned, painted, misc. repairs; 28 ship repair jobs not requiring docking; 29 commercial jobs.

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); LBP, 334'; beam, 35' 1/8"; loaded draft, 10'10"; geared turbine engines; express type boilers; keel laid August 15, 1934; launched, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); LBP 334'; beam, 35'⅛"; loaded draft, 10'10"; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; launched Dec. 31, 1935.

Two 1500-ton destroyers for U. S. Navy; order placed August 21 1934: **DD392, Patterson**, keel laid July 23, 1935; and **DD393, Jarvis**, keel laid August 21, 1935, estimated completion dates, February 1, 1937 and May 1, 1937, respectively.

Construction of **Destroyer No. 408** authorized.

Care and Preservation (out of Commission): **Aroostook, Jason, Kearsarge, Patoka, Pawtucket, Prometheus, Pyro.**

DRYDOCK, PAINT, MISCELLANEOUS **Pennsylvania, Nevada, Swallow, Mahopac, Tatnuck, Challenge, Wando, New York, Colorado, West Virginia, Nitro.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Hollywood, S.S. Pennsylvanian, S.S. Mexican, S.S. Starr, S.S. Edward Luckenbach, S.S. Border King, M.S. Ballard, Tug Wilson.**

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith**, Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery May 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154'; beam 38'; two i.h.p. Atlas engines; keel laid May 25, 1935; launched Jan. 14, 1936; delivery date not given.

Hull No. 114. One purse seine boat; 82' L.B.P.; keel laid September 1, 1935.

Orders received for **4 purse seine fishing vessels.** Complete data next month.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges**; 132' x 35' x 10'; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; 18 delivered.

Six standard steel coal barges, 175' x 26' x 11' for Tri-State Transportation Inc.

One derrick boat hull, 90'x30'x5'; for Halliday Sand Company, Cairo, Ill.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hull No. 159, **Drayton (DD 366)**, torpedo boat destroyer. U.S. Navy; keel laid, March 20, 1934; launched March 23, 1936; estimated delivery May 18, 1936.

Hull No. 160, **Lamson (DD 367)**, torpedo boat destroyer, for U.S. Navy;

IN AMERICAN SHIPYARDS

Edited by J. Suitor

keel laid, March 20, 1934; launching, May 20, 1936; estimated delivery, July 13, 1936.

Hulls Nos. 161, 162, and 163; **DD394, DD395 and DD396;** Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively.

Hulls Nos. 164, 165, and 166, trawlers, single screw, steel, diesel propelled, for delivery in July or August, 1936, to Boston, Mass., owners.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA-39, Quincy,** 10,000 tons. Keel laid Nov. 15, 1933; launched June 19, 1935; estimated delivery March, 1936.

Heavy Cruiser CA44, Vincennes, 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD361, Clark, keel laid January 2, 1934; launched October 15, 1935; estimated delivery April, 1936.

DD362, Moffett, keel laid, January 2, 1934; launched Dec. 11, 1935; estimated delivery April, 1936.

DD363, Balch, keel laid, May 16, 1934; estimated delivery, June, 1936.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

BETHLEHEM SHIPBUILDING CORPORATION
Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers**—steam—425′x64′x34′ for Gulf Refining Co.; total tonnage 7070 each.

CHARLESTON SHIPBUILDING & DRYDOCK CO.
Charleston, S.C.

NEW CONSTRUCTION: **One 60-ft. all-welded lighter** for stock. Rebuilt 6 lighters (wooden) for Chesapeake Corp.

DRYDOCK, PAINT, MISCELLANEOUS: Repairs to **Tender Mangrove,** U.S. L.H. Dept.; **Launch 57; Tug Hinton; Schooner Anna R. Heidritter; Tug Tug Lockwood.**

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One yacht,** L.B.P. 115′, beam 17′-6″, loaded draft

(Continued on Page 142)

Bethlehem's Pacific Coast Plant Lays Keels of Two U.S. Destroyers

The start of construction on first vessels of any considerable size to be built on the Pacific coast for several years took place during the past month when Bethlehem Shipbuilding Corporation's Union plant was the scene of the keel-laying of two torpedo boat destroyers for the United States navy, DD 400 on March 17, and DD 401 on March 24. No name has yet been assigned to either vessel.

These 1500-ton craft are of the latest type of construction, as developed by the naval experts. The lighter portions of the hull, which can be made up readily in multiple and shipped in carload lots, are being fabricated in Bethlehem's Fore River plant where four sister destroyers are now under way.

Work on these two vessels will keep a large force of skilled tradesmen busy at the Union Plant for over a year.

News of the Yards

● **United Dry Docks, Inc.,** Staten Island, New York, have under way at their yard, three ferry boats for the City of New York. These craft have a length overall of 267 feet, an extreme breadth of 66 feet, and a depth of 19 feet, 9 inches. Keels will be laid on April 14, May 5, and May 26 respectively, and estimated delivery date is set at January 26, 1937.

● **The Bath Iron Works,** Bath, Maine, was the scene of the launching of U.S.S. Drayton on March 23. Miss Barbara Edith Drayton was sponsor. U.S.S. Drayton, the keel of which was laid at the Bath plant on March 20, 1934, is a torpedo boat destroyer. She will be delivered on May 18, 1936.

● **The Pusey & Jones Corporation,** Wilmington, Delaware, who are building the new Nantucket Light ship for the United States Department of Commerce, Bureau of Lighthouses, launched that vessel on March 21. She will be delivered about the first of May. Nantucket Light ship No. 112 has a length between perpendiculars of 121 feet, 6 inches; a 31-foot beam and 13-foot loaded draft. She is equipped with a 600 indicated horsepower compound engine, two watertube boilers with a pressure of 165 pounds.

● **Shipbuilding plants of the San San Francisco Bay region** which have been closed due to labor conditions, announce that they have all re-opened for operation. General Engineering and Drydock Company, Oakland, California, resumed business on March 17; Moore Drydock Company, San Francisco, on March 16; and Bethlehem Shipbuilding Corporation's Union Plant, San Francisco, on March 16. Complete details of work under way at these yards from the time of re-opening will be published in Pacific Marine Review in our next issue.

● **Marrietta Manufacturing Company,** Point Pleasant, West Virginia, are building four all-welded oil barges for the Standard Oil Company of New Jersey. These barges, which will have a 6000-barrel capacity each, will be 175 feet by 35 feet by 8 feet 6 inches. They are being constructed for service on the Ohio River and tributaries.

● **Manitowoc Shipbuilding Company,** Manitowoc, Wisconsin, has under construction a steel dredge hull for United States engineers.

● **Fellows & Stewart,** Wilmington, California, are building an auxiliary cutter for R. S. Cooper of Burbank, California. The boat has a length between perpendiculars of 43 feet 3 inches; a load line of 31 feet 9 inches; a beam of 12 feet; and a draft of 6 feet 5 inches. Her sail area will be 1061 square feet. She will be powered by a Kermath Sea Bird motor—31 horsepower—with two to one reduction gears. Propellers are 3-blade Hyde feathering. Keel was laid on February 17, with delivery set for ninety days from that date. The designer was John G. Alden, Boston, Mass.

● **Charleston Shipbuilding & Drydock Company,** Charleston, South Carolina, have under way a 60-foot, all-welded lighter for stock. They have just finished rebuilding six lighters (wooden) for the Chesapeake Corporation.

● **American Bridge Company,** Pittsburgh, Pennsylvania, are constructing a derrick boat hull for Halliday Sand Company, Cairo, Illinois. It will be 90 feet by 30 feet by 5 feet. Of the 30 barges under way for the Mississippi Valley Barge Lines, St. Louis, Missouri, 13 have been delivered. These barges are 132 feet by 35 feet by 10 feet, and weigh 7500 tons. They are equipped with cargo houses.

● **Treadwell Construction Company,** Midland and Erie, Pennsylvania, are working on a steel gold dredge of the ladder type for a South American firm. The hull will be 155 feet by 70 feet by 13 feet. This company is also building two oil barges for Campbell Transportation Company; two 15-ton whirler derrick boats with 85-foot boom for the U.S. Engineers at Huntington, W. Virginia; 1 derrick boat for U.S. Engineers at Vicksburg, Mississippi; and 10 coal barges (175 ft. by 26 ft. by 11 ft.) for the Pittsburgh Coal Company.

● **Newport News Shipbuilding & Drydock Company,** New York, N.Y., will launch the aircraft carrier for the U.S. Navy, CV5, Yorktown, on April 4. Keel for CL49 St. Louis, light cruiser for the U.S. Navy, will be laid on September 7 of this year.

Progress of Construction

(Continued from Page 141)

5'6"; speed loaded 16 miles per hour; keel laid February 15; estimated launching October 15; estimated delivery, June 1936.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hulls Nos. 1237 and 1238, two steel hulls for towboats 169' x 34' 6" x 7' 2" of 1540 gross tons.

Hulls Nos. 1240-1243, incl., 4 covered cargo barges 132 x 35 x 11 for stock, of 2072 gross tons.

Hulls Nos. 1244-1245 two welded towboat hulls 145' x 32' x 6'4" for Pittsburgh Coal Co., of 600 gross tons.

Hulls Nos. 1246-1255, inclusive; 10 welded coal barges 175' x 26' x 10'8" for stock of 1720 gross tons.

Hull No. 1256, welded steel towboat hull, 90'x22'x5' for M & O Dredging Co., Pittsburgh, Pa.; 135 gross tons.

Hulls Nos. 1257-1261, inclusive; five welded W-2 coal barges; 175'x26'x 10'8"; of 2360 gross tons.

Hulls Nos. 1262-1265 inclusive; four welded flush deck cargo box barges, 100'x26'x6'6"; 660 gross tons.

Hull No. 1267, 1 steel coal barge 130'x34'x4'3" for Pennsylvania Railroad Company, 530 gross tons.

Hull No. 1268, 1 steel hull for towboat, 173'x34'6"x7'2" for John W. Hubbard, Pittsburgh, Pa.; 770 gross tons.

This makes a total of 31 hulls under contract, with a total gross tonnage of 13,478.

ELECTRIC BOAT CO.
Groton, Conn.

NEW CONSTRUCTION: Hull No. 19, fleet submarine, **Shark, (SS174):** L.B.P. 298'; beam,, 25'; standard displacement, 1315 tons; keel laid, October 24, 1933; launched May 21, 1935; delivery, Jan. 1936.

Hull No. 20, **Tarpon (SS175):** L.B.P. 298'; beam, 25'; standard displacement, 1316 tons; keel laid, Dec. 22, 1933; launched September 4, 1935; possible delivery, Feb. 1936.

Hull No. 23, **Perch, S.S. 176,** building for U.S. Navy; keel laid, February 25, 1935; estimated launching, May, 1936.

Hull No. 24, **Pickerel, S.S. 177** keel laid March 25, 1935; estimated launching, June, 1936.

Hull No. 25, **Permit,** S.S. 178, keel laid June 6, 1935; estimated launching, August 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser** and **DD369 Reid** for the U. S. Navy, estimated completion dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington;** keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937.

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938.

One 12,800 tons tanker, "T. C. McCobb", for the Standard Oil Company of New Jersey, launched on February 8, 1936; estimated completion April, 1936.

Two 12,800 tons tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; estimated completion dates October 1936 and December 1936, respectively.

MANITOWOC SHIPBUILDING CO.
Manitowoc, Wis.

NEW CONSTRUCTION: **One steel dredge hull** for U.S. Engineers.

MARIETTA MANUFACTURING CO.
Point Pleasant, West Virginia

NEW CONSTRUCTION: **One Steel Hull Anchor Barge,** Hull Size 60' x 22' x 4'—with steel A frame, deckhouse, and machinery. Built under contract with the U. S. Engineers Office at Vicksburg, Miss., completed and delivered.

One steel barge, 140' x 34' x 10', of 6000 barrels capacity, for the Ashland Refining Co., Ashland, Ky., launched, March 14, 1936; delivered, March 15, 1936.

Ten standard steel coal barges, 175' x 26' x 11' for stock.

Three all-welded steel oil barges, 150'x30'x7' for export.

Two steel needle flats; 40'x14'x3'6"; for Engineers' Office, Cincinnati, Ohio.

Four all-welded oil barges; 175'x35' x8'6"; 6,000 barrel capacity each, for Standard Oil Company of New Jersey, for service on Ohio River.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359** air

craft carrier **CV5, Yorktown,** for U. S. Navy; keel laid May 21, 1934; estimated launching, April 4, 1936; original contract for delivery, October 3, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; original contract for delivery February 3, 1937.

H361, light cruiser, CL47, Boise, keel laid Apr. 1, 1935; original contract for delivery, August 22, 1937.

H362, light cruiser CL49, St. Louis; estimated keel laying Sept. 7, 1936; estimated delivery, Jan. 2, 1939.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357); Hull No. 410, McDougal (DD358); Hull No. 411, Winslow (DD359);** of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge,** Feb., 1936; **DD358, McDougal,** Apr., 1936; **DD359, Winslow,** June, 1936; **CL42, Savannah,** Aug., 1936;**CL43, Nashville,** Dec. 1936; and **CL46 Phoenix,** August 1937.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 1063, Nantucket Lightship No. 112,** building for U.S. Dept. of Commerce—Bureau of Lighthouses; L.B.P. 121'-6", beam 31', loaded draft 13', compound engine, 600 i.h.p., 2 watertube boilers, pressure 165 pounds, keel laid July 17, estimated launching, March 21, 1936; estimated delivery, May, 1936.

SUN SHIPBUILDING COMPANY
Chester, Pa.

NEW CONSTRUCTION: **Hull No. 151 Meadville,** ferryboat for Erie Railroad Co.; L.B.P. 192'; beam, 45'; loaded draft, 17'9"; speed loaded 12-13 m.p.h.; 1700 i.h.p. Skinner Uniflow engine; 2 watertube boilers; keel laid June 10, 1935; estimated launching, March 7, 1936; estimated delivery, March 21, 1936.

Hull No. 152—steel, twin screw, truck automobile and passenger steamer for Virginia Ferry Corporation. Length 260 ft., beam 59 ft., depth 19 ft. 1 in. 2 4-cylinder Skinner Unaflow engines—each 1400 S.H.P. 2 Foster Wheeler Water Tube boilers, cross drum sectional header type 285 pounds pressure. Estimated date of keel laying Oct. 15; launching April 18; delivery May 15, 1936.

Hulls No. 153-154—steam, single screw, steel oil tankers for Gulf Refining Company. Length between perpendiculars 425 ft., beam moulded 64 ft., depth moulded to upper deck 34 ft., loaded draft 27 ft. 6 in. Each vessel: 1 2800 S.H.P. Westinghouse cross compound double reduction geared turbine unit; 2 Foster Wheeler type A 3 drum boilers—400 pounds pressure. Estimated dates for No. 153. Keel laying Nov. 15; launching Apr. 27, 1936; delivery May 20, 1936. Estimated dates for No. 154: Keel laying November 30; launching June 15, 1936; delivery July 6, 1936.

Hulls No. 155-156. Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485'6"x68'0"x37'0"; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; launching Sept. 19, 1936; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511'x65'9"x37'; 9800 tons.

Hull No. 160, 1 oil tanker (steam) 520'x70'x40' for Atlantic Refining Co.; 11,400 tons.

TREADWELL CONSTRUCTION COMPANY
Midland and Erie, Pa.

NEW CONSTRUCTION: **six barges,** 100'x26'x6'6", for Treadwell Construction Company.

24 Barges 175' x 26' x 11' for Marion Steam Shovel Co., Marion, Ohio, 21 delivered.

2 Oil Barges 195' x 35' x 9'6" for Campbell Transportation Co., Pittsburgh, Pa., one delivered.

2 15-ton whirler derrick boats—85-foot boom for U. S. Engineers, Huntington, W. Va.

1 Derrick boat for U.S. Engineers at Vicksburg, Miss.

10 Coal Barges, 175'x26'x11', for Pittsburgh Coal Co.

1 steel gold dredge (ladder type) **hull** 155'x70'x13' for South American firm.

UNITED DRYDOCKS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION: **DD364, Destroyer Mahan,** keel laid June 12, 1934; launched October 15, 1935; estimated completion, June 1, 1936.

DD365, Destroyer Cummings, L.B.P. 334'; beam 35'; mean draft 10'10"; keel laid June 26, 1934; launched Dec. 11, 1935; estimated delivery Aug. 1, 1936.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; estimated launching April 18, 1936; estimated delivery indefinite.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; estimated launching, June 7, 1936; delivery indefinite.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York, [illegible] overall, 66' extreme breadth, 19'6" depth; estimated keel laying April 15, May 5, and May 26, 1936, respectively; estimated launching, November 17, December 8, and December 29, 1936, respectively, estimated delivery January 26, 1937.

UNITED STATES NAVY YARD
Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case,** L.B.P. 334'; beam 35'; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, July 1936.

Destroyer DD371, Conyngham, L.B.P. 334'; beam 35'; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, Oct. 1936.

DD389 Mugford and DD390 Ralph Talbot, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May, 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD
Charleston, S.C.

NEW CONSTRUCTION: **U.S.S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; launched Feb. 25, 1936; estimated completion date, June 1, 1936.

One **Coast Guard Cutter** (2000 tons) Keel laid Aug. 15, 1935; estimated launching Aug. 1936; estimated completion, Jan. 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser. L.B.P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, April, 1936; estimated delivery, Dec., 1936.

CL 48, **Honolulu,** light cruiser; L.B.P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January 1937; estimated delivery October 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600'; beam 61'7⅝"; standard displacement 10,000; geared turbine engines; express type boilers.

PG. 50, **Erie,** gunboat; L.B.P., 308'; beam, 41"; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; estimated launching, January 29, 1936; estimated delivery, May 1, 1936.

CG 69 and CG 70, **Alexander Hamilton** and **John C. Spencer**, cruising cutters for U.S.C.G. service; L.B.P. 308′; beam 41′; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia**, L.B.P. 600′0″; beam 61′,7¾″; molded depth at side to main deck amidships 42′0⅝″; draft corresponding to normal displacement 21′,8½″; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

DD372, **Cassin**.L.B.P., 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships 19′,7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid, October 1, 1934; estimated completion date, March 15, 1936.

DD373, **Shaw**, L.B.P. 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships, 19′7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid October 1, 1934; estimated completion, June 15, 1936.

Coast Guard Cutter No. 65, George W. Campbell; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, July, 1936.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61′ 9¾″, depth molded at side to main deck amidships 42′0 3/8″, draft corresponding to normal displacement 21′10″; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404**, 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS 172, Porpoise; keel laid, October 27, 1933;** launched June 20, 1935; completed Jan. 15, 1936; **SS 173 Pike**, keel laid, Dec. 20, 1933; launched Sept. 12, 1935; commissioned Dec. 2, 1935; estimated delivery, May, 1936; **SS 179 Plunger** keel laid July 17, 1935, estimated delivery Feb., 1937; **SS 180 Pollack**, estimated delivery May, 1937; L.B.P. 289′ 0″; beam 24′ 11-1/16″; loaded draft 13′9″; diesel electric engines.

Two 1400-ton submarines, SS185 Snapper and SS186 Sturgeon, order received from Navy Department; September, 1935.

UNITED STATES NAVY YARD
Portsmouth, Va.

NEW CONSTRUCTION: Torpedo Boat Destroyer **Tucker (DD374)** for U.S. Navy, 341 ft. long; beam 35′; loaded draft, 10′10″; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, February, 1936.

Torpedo Boat Destroyer **Downes (DD375)** for U.S. Navy, 344 ft. long; beam 35′; loaded draft, 10′10″; treaty standard displacement, 1500 tons; No. 4 boilers; 35 knots speed; estimated delivery, May, 1936. Laying down lines under way in mold loft.

Torpedo Boat Destroyer **Bagley (DD386)** for U.S. Navy; keel laid Aug. 31, 1935; estimated completion November 1, 1936.

Torpedo Boat Destroyer **Blue (DD-387)** for U.S. Navy; keel laid, Sept. 25, 1935; estimated completion, Feb. 1, 1937.

Torpedo Boat Destroyer **Helm (DD-388)**; keel laid Sept. 25, 1935; estimated completion, May 1, 1937.

Order placed for **DD405** and **DD406**, two 1500 ton destroyers; no dates set.

Freights, Charters, Sales

(Continued from Page 139)

& Russell; British stmr. Harcalo, Coos Bay and Columbia River to Shanghai, March, J. J. Moore & Co.

TANKERS: Norwegian tank stmr. Svolder, California to China, clean, 15/6, March; Norwegian tank m.s. Evina, California to Japan, dirty, 5/-, option two additional voyages 14/6, February/March; Danish tank m.s. Emma Maersk, California to Japan, dirty, 17/6, March; Norwegian tank m.s. Nore, California to Japan, dirty, 15/6, two voyages, March; Norwegian tank stmr. Sir Osborn Holmden, California to Japan, dirty, 16/-, March; British tank m.s. Athel ——, one port California to one port Japan, 13/6, April, Asano Bussan; Norwegian tank mss. Rigmor and Svolder, California to Australia, clean, 25/-, (Australian), April/May.

ORE: British stmr., Odessa and/or Novorossick to Tacoma, 10/6, f.i.o., April; a British stmr., Odessa and/or Novorossick to Tacoma, 10/6, f.i.o., March; a Greek stmr., Odessa and/or Novorossick to Tacoma, 10/- f.i.o., April; a Smith stmr., Novorossick to Tacoma, 9/9, f.i.o., May.

TIME CHARTERS: Norwegian m.s. Chr. Knudsen, time charter extended 6 to 9 months, March 1936, Anglo Canadian Shipping Co.; British m.s. Larchbank, delivery Colon, redelivery Australia via British Columbia, March, J. Coughlan & Sons; British stmr. Penrose, delivery North Pacific, redelivery Europe, $1.35, March; Norwegian m.s. Handicap, Pacific Trade, 12 to 18 months, March/April.

MISCELLANEOUS: Norwegian stmr. Eir, delivery U.S. Atlantic, redelivery U.K./Cont., via North Pacific, prompt; American stmr. Chetopa, San Francisco to Panama Canal, for orders, March, Cargill Grain Co.

SHIPPING SALES: American stmr. San Diego, HartWood Lumber Co. to Reitz S.S. Co., of Los Angeles; American stmr. Mazama, Mazama Steamship Company to Hovden Food Products Co. of Monterey.

PAGE BROTHERS
Brokers.

Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

● Armes

George A. Armes has been re-elected president of the Los Angeles Shipbuilding and Dry Dock Corporation, according to announcement made following the annual stockholders' meeting at San Pedro on March 20. The following executive officers were also selected: **C. C. Spicer**, vice president; **L. J. Reinhardt**, secretary-treasurer; and **Elizabeth Donaldson**, assistant secretary. **George A. Armes, H. K. Bagley, Milo A. Baker, John C. McHose, G. Lincoln Skolfield, C. C. Spicer,** and **Thomas A. Thatcher,** were chosen directors.

Captain John Lass, veteran master of McCormick Steamship Company, has been appointed to the position of operating manager for Puget Sound. Captain Lass was formerly in command of the Pacific-Argentine-Brazil liner, West Ira.

Zac T. George, for the past four years freight traffic manager in San Francisco for Grace Line, tendered his resignation from that position in March, to become effective April 15.

Folger Athearn, for several years general passenger agent in San Francisco for the McCormick Steamship Company, was seriously ill during March with scarlet fever. Shortly before his illness, Mr. Athearn was appointed to the position of owner's representative at Vancouver, British Columbia.

Kazuo Takahashi, who has taken over the position of general manager in San Francisco for Nippon Yusen Kaisha, was host at a dinner aboard the Tatsuta Maru on March 17. Although Mr. Takahashi had arrived several days previously, the dinner was his first public appearance. Guests included many of the most prominent shipping men in the bay region.

Edward C. Merrill of Portland, Oregon, formerly assistant superintendent of the Seventeenth Lighthouse District with offices at Portland, has been appointed to the position of superintendent. The seventeenth district includes the waters of Washington and Oregon and the Columbia River. The vacancy was created by the death last January of **Frank A. Muth,** appointed superintendent in November, 1935.

● Matson

Several changes in personnel aboard Matson liners which have taken place during the month include the appointment of **W. H. Hutchinson** as cabin class purser aboard the Monterey, to succeed **F. C. Lee,** who has been assigned to the Lurline. Aboard the Malolo, **L. H. Otzen,** succeeds **M. C. Hayes** as cabin class purser. Hayes will be shoreside for a while. **E. Gibson** is now assistant purser on the Lurline.

E. N. Tormey, district manager in Los Angeles of the Interocean Steamship Company, announces increases in his staff looking toward a gradual extension of that service. The additions include the appointment of **A. C. Appel** to the freight department of the Pacific Coast Direct line, Interocean's intercoastal branch, and the appointment of **C. F. Staples** as claim agent. Appel was formerly with the Williams Line and Staples was formerly claim agent for the Dollar Line.

MIDNIGHT SAILINGS REVIVED WITH RETURN OF NORMANDIE TO SERVICE

Revival by the French Line of the midnight sailing, which, a few years ago, assumed the proportions of a gala "top-hat-white-tie-and-tails" social event, will be instituted by the company's flagship Normandie, world's largest and fastest ship, when she re-enters service early in May, according to announcement made recently by **Henri Morin de Linclays,** resident general manager of the French Line.

Previously scheduled to quit her pier in mid-afternoon on May 13 and 27, June 17, July 1 and 15, the Normandie will sail instead, in each instance, at five minutes before the preceding midnight: 11:55 p.m. on May 12 and 26, June 16 and 30 and July 14.

The change has been considered advisable because it will result in the Normandie arriving in both Southampton and Havre at an hour more convenient to her passengers than would have been possible if the sailing hours of 1 to 5 p.m. had been maintained.

TAP DANCERS ? NO, BELL HOPS !

These boys answer your ring for service when you voyage to Hawaii on the Matson liner Malolo. Veteran of 53 round trips between mainland and territorial America is A. Jaskulek, right, captain of the bell boys. His staff, left to right, includes R. Patterson, A. Wilkie, L. Vonedelkrantz, G. T. Lishman, C. Schultz, E. Cooke and H. Roher.

Propeller Club

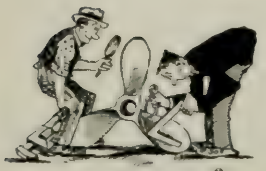
Sec. 562, P. L. & R.

SPRING GOLF TOURNAMENT

AT

CALIFORNIA GOLF CLUB :-: BADEN, CALIFORNIA

Tuesday, April 21, 1936



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OF HANDICAPS

SAME OLD SLOGAN

"Invite Your Friends — Make Up a Foursome"
and Report on the First Tee After 12 Noon

GREEN FEES AND DINNER . . $4.00
DINNER ONLY (6:30 p. m.) . . $2.00

including

Impromptu Entertainment

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FOUR FLIGHTS FOR MEMBERS
TWO FLIGHTS FOR GUESTS

WINNER AND RUNNER-UP PRIZES EACH FLIGHT

(Hole Out All Your Putts)

Please make reservations promptly to facilitate setting of handicaps
Entries must be in by Saturday, April 18th

Mail the attached slip with check payable to
Vernon S. Showell

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Grover Coats
Frank De Benedetti
John T. Greany
Roger Lapham
Carroll Reeves
Graham Smith
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JOHN T. GREANY
C. M. Le COUNT
FLETCHER MONSON

● Robert L. Hague Elected to Honorary Membership

We are also pleased to record the election to honorary membership, of:

Robert L. Hague
General Manager, Marine Dept.
Standard Oil Company of New Jersey
New York City

Mr. Hague is truly a distinctive figure in the American Merchant Marine, heading up one of the world's largest operating companies. He has legions of friends out here on the coast, where he served as Superintending Engineer and Naval Architect of the Standard Oil Company of California for many years, progressing to executive work after a background of engine-room experience with American-Hawaiian. It has been often said of "Bob" Hague:

"He never forgets a friend!"

R. Sutton Myers has assumed the duties of chief purser aboard the Matson liner, Monterey. Mr. Myers, who is the son of Ralph Myers, manager in San Francisco of Hobbs, Wall & Company, and former president of the Propeller Club, has been with the Matson Line for five years, his position prior to the present appointment being that of assistant purser.

● Golfers ! ! !

At the mast-head of this page, appears a reproduction of the Golf Committee's announcement of this Spring tournament. Vernon Showell says everyone he has contacted is planning to enter. Looks like a record-breaking affair! Have you sent in your reservation?

● Jinks ! ! !

Dick Glissman reports:

"Stand by for the big Spring Banquet. The date has been set — and plans are under way to give you all a grand and glorious affair!"

Saturday evening, May 23, in the Terrace Ball Room of the Fairmont!

Details will reach you through the mails.

### ● Luncheon Meetings

March 3. Inland Waterways Corporation presented the movie-tone film showing the developments of the transportation company's system in the Mississippi Valley.

Garrett S. Wilkins was our honored guest sponsoring the showing.

The film came up to advance billing and proved unusually interesting. Edward H. Harms, our Board of Governors Chairman, introduced the program.

The March 17 luncheon meeting was cancelled because of the conflict of dates with other local events in which many of our members participated.

The March 31 meeting is being staged by our Legislation Committee and detailed announcement of Guest Speaker and other features is being mailed as this is written.

The committee, headed by Charles E. Finney, is actively analyzing the various legislative proposals which are engaging the House and Senate during the present session in Washington. The Ship Subsidy bill will be thoroughly discussed at this next meeting.

### ● New Members

Stanley Allen, Secretary-treasurer, announces the election to membership of:

Cyrus A. Anderson
of Anderson-Mattoon Co., Inc.
149 California St., San Francisco

Theron L. Prentiss
of Marsh & McLennan
Russ Building, San Francisco

Propeller Club of California Declares on Pending Legislation

Reproduced herewith is the analysis of legislation measures under consideration by the present Congress—made by the Propeller Club of California through the special committee headed by Charles E. Finney.

This analysis was conveyed by formal letter on April 7 to all members of the House and Senate. These observations will be of interest to ship operating readers of Pacific Marine Review and all others having at heart the welfare of the American Merchant Marine.

Washington, D. C.
Dear Sir:

We, The Propeller Club of California, an organization established for the purpose of investigating and discussing problems affecting the welfare of the American Merchant Marine and to aid in their solution, to promote the American Merchant Marine and to improve conditions and affairs therewith, having studied the following bills now before the Seventy-Fourth Congress, present the following for your consideration.

H.R. 6203

Puts all vessels propelled by internal combustion engines under the same inspection rules as steam vessels.

This would undoubtedly place a tremendous burden on operators in that it would mean that there would have to be a licensed master and engineer on all boats of 15 gross tons or over.

H.R. 6189

Provides that every vessel equipped with steam boiler and engine, except public vessels of the United States and vessels of other countries, shall be inspected; provides further that there shall be a licensed engineer on board at all times when boiler is generating steam.

This rule would place an unwarranted burden on small craft, such as scow schooners, derrick barges, etc., which at the present time are adequately regulated by the State boiler inspection laws. (The State of California inspects all steam boilers that are not inspected by the Steamboat Inspection Service—certificate is good for one year.)

H.R. 7319

Provides that every inspected vessel shall have on board one duly licensed master and one duly licensed engineer. (This will take in vessels of 15 gross tons and over if Bill H.R. 6203, referred to above, is passed.)

Provides that every vessel of 1,000 gross tons and over shall have in service and on board 3 licensed mates and 3 licensed engineers who shall stand in 3 watches while such vessel is being navigated; if such vessel is engaged in runs less than 250 miles from port of departure to port of final destination, then such vessel shall have 2 licensed mates and 2 licensed engineers, who with the master and chief engineer shall stand in 3 watches.

Every such vessel between 100 and 1,000 gross tons shall have 2 licensed mates and 2 licensed assistant engineers, who with the master and chief engineer shall stand in 3 watches.

Every such vessel of less than 100 gross tons shall have on board and in her service 1 licensed mate and 1 licensed assistant engineer, but if such vessel is engaged in a trade in which the time required to make passage from departure port to destination port exceeds 16 hours, then such vessel shall have 2 licensed mates and 2 licensed assistant engineers.

Provides that licensed officers shall have at least 6 hours off duty within the 12 hours immediately preceding sailing time.

Provides that no licensed officer shall be required to do duty exceeding 8 hours of any 24 while in port, including date of arrival, or more than 8 hours of any 24 while being navigated, except in case of emergency when life or property is endangered.

This bill is inconsistent and places a burden on operators for the following reasons:

(a) Would require small craft operators to have as many as 6 licensed officers aboard.

(b) There are no quarters available, nor is there room for same, to take care of the additional licensed officers required.

(c) Would force small craft out of

(Please turn to Page 30)

● Dollar Steamship Appoints New Vice-Presidents

President R. Stanley Dollar, on Thursday, March 26, announced the appointment of six new vice-presidents of the Dollar Line, four of whom are members of the San Francisco office of that organization. These four are **Charles King**, for many years assistant to Mr. Dollar, and now executive vice-president; **Hugh Mackenzie**, passenger traffic manager; **M. J. Buckley**, freight traffic manager; and **W. J. Bush**, now vice-president in charge of operations. The other two promotions came to **O. G. Steen**, of the Shanghai office, and **George S. Hinkins**, in New York.

Mr. Buckley's experience in the shipping business dates back to 1902 when he joined the old Pacific Mail Steamship Company. He was with that organization until the company was dissolved in 1915, at which time he entered the ship agency business. In 1921 he became manager in charge of operations for the United States Shipping Board, and joined the Dollar Steamship Lines in 1922.

Charles King has made a life study of the intricate problems of transportation. He is recognized as one of the keenest minds in the shipping industry.

Hugh Mackenzie, also has had extensive experience in the transportation field. He began as a filing clerk for the Union Pacific Railroad, and remained in that company, receiving numerous promotions, until his interest led him into coastwise shipping. He left the position of assistant general passenger agent for the Pacific Steamship Company in Seattle in 1923 to take charge of the passenger department of the Dollar Line.

Mr. Bush began his career in the shipping world with the old Pacific Steamship Company in 1916. In a short time he became secretary to R. Stanley Dollar.

Mr. Steen joined the Dollar Line at the time that it expanded into a world-wide shipping business, and since that time has been located in the Orient.

Mr. Hinkins entered the Dollar Line as agent at Baltimore, being promoted from there to the New York office, where he was company manager until his promotion gave him the position of vice president in charge of the Eastern territory.

T. F. Luedtke named Assistant to McCormick's Ray Burley

The announcement of the appointment of **T. F. Luedtke** as assistant to **R. F. Burley**, freight traffic manager, and **G. P. Pell**, assistant freight traffic manager of the company, was made late in March by the McCormick Steamship Company. Mr. Luedtke was transferred to San Francisco from the Portland office, where he held the position of chief clerk of the traffic department. He joined McCormick Steamship Company in 1923, and is considered one of the best informed and most capable rate men on the Pacific Coast. Last year he was admitted to practice before the Interstate Commerce Commission.

John Scotto, French Line Immigration Expert, Promoted to Pacific Coast Post

Familiar Figure on New York Waterfront gets Southern California Territory.

One of the New York waterfront's most prominent and popular personalities, **John J. Scotto,** for more than a decade the French Line's landing agent and assistant passenger traffic manager in charge of immigration, will leave shortly for Los Angeles to take up his new duties as general agent of the line's southern California territory, to which post his appointment was announced recently by **Henri Morin de Linclays**, resident general manager of the French Line here.

This promotion puts Scotto in a particularly important key position in the French Line's American sales organization, its very importance being the reason for the selection of so experienced and valued a member of the New York staff to fill the post.

"Jack" Scotto is known to literally thousands of trans-Atlantic travelers, his tri-lingual accomplishments in English, French and Italian and his duties on arrival of ships at quarantine, have brought him into particularly close contact with stars of the operatic, musical and cinema world, among whom are many of his most intimate friends.

Born on February 24, 1898, he was educated in the New York public schools, Stuyvesant High School and the New York Art School, following which he became an accomplished scenic artist with the Metropolitan Opera Company in New York and other opera companies in Pittsburgh, Philadelphia and Boston.

But an inborn inclination toward the shipping business—probably inherited from his father, who, in the '70's, owned a fleet of square-riggers —led him, in 1920, into the post of traveling passenger agent for the Navigazione Generale Italiana, and in 1922 he joined the French Line as manager of the Immigration Department, being named assistant passenger traffic manager in 1930.

Although Scotto can neither sing a note nor play any musical instrument, he comes from a musical family. His impresario brother, Ottavio Scotto, has been acclaimed in many South American cities, including Rio de Janeiro, Sao Paulo and Buenos Aires, and in 1926 was invited by Mussolini to take charge of the inauguration of the Royal Opera House in Rome for the Fascist Government, where he remained for two years.

"Jack" Scotto's talents as a scenic artist were put to good use by the United States Government during the World War, when he served as a battleship camouflage expert. He is actively devoted to outdoor sports, was at one time a semi-professional baseball player, and as a track runner came within 1/5 of a second of the then record of 9-4/5 seconds. He is an enthusiastic golfer, playing in the low 80s, and is fond of trout-fishing when the opportunity to indulge presents itself. His hobby is his home, but his duties have thus far given him little time to enjoy it.

He was the guest of honor at a dinner tendered him by his friends of the shipping industry, the Customs and Immigration Services of the Government, and the musical and newspaper professions, at the Hotel Astor on Thursday, March 26, on the eve of his departure for his new post on the Pacific Coast.

I. M. M. Appointments

Captain Schuyler F. Cumings, popular commander of the United States liner Washington, has quit the sea after twenty-nine years of service to accept the post of marine superintendent of the International Mercantile Marine Company, which owns the United States Lines, it was announced recently by **A. J. McCarthy,** vice president of the company in charge of operations. In his new post, which he assumed March 9, Captain Cumings succeeds Captain Thompson H. Lyon who retired on January 31 after forty-four years of service with the company.

Captain Giles C. Stedman has been appointed master of the Washington.

Captain Cumings, a descendant of old New York families going back to the original Dutch settlers, was born in New York in 1891. He began his sea career in 1907 as cadet in the schoolship Newport, from which he was graduated in 1909. He first saw sea service as deck boy in the three-masted barque Von Foong, carrying sugar machinery from New York to Hawaii around Cape Horn. He had reached the rank of chief officer when the world war broke out and he joined the United States navy as an ensign. He rose to the rank of lieutenant commander during his war service.

Captain Cummings entered the United States Lines' service in 1922 as chief officer in the President Fillmore and has commanded various ships of the line since that time. He served as staff captain of the Leviathan in 1930, 1931, and 1932. In 1933 he made several voyages in the Manhattan and was regularly appointed to that vessel in June 1934. He has been in command of the Washington since October 1934.

Captain Cummings received the medal of the New York Lifesaving Benevolent Association in 1928 in recognition of distinguished service when, as master of the American Shipper, he directed the rescue of 125 persons from the Vestris, the largest number of survivors brought into New York. He also participated in several other rescues.

● Fred Ducato Receives Grace Appointment

Fred Ducato has been promoted to freight traffic manager of the Grace Line with headquarters in San Francisco, it was announced by **Fred L. Doelker**, Pacific Coast manager.

Ducato succeeds **Zac T. George,** whose resignation is effective April 15, 1936. He is now conferring with **Edward T. Ford,** president, who is at present in New York. For the past year Ducato has been in the New York office of the Grace Line.

Mr. and Mrs. Ducato sailed for San Francisco aboard the company's liner Santa Rosa on March 28, arriving April 14, when he will assume his new duties as freight traffic manager.

Born in San Francisco 28 years ago he will be one of the youngest freight traffic executives in the steamship business. He attended Lowell High School and later Stanford University and is a member of Phi Kappa Psi.

Since graduation Ducato has been with the Grace Line and is widely-known in San Francisco being active in club and business organizations.

Fred Ducato, who takes up new executive duties with Grace Line.

● J. W. Barnett Appointed Assistant Manager Marine Department, Babcock & Wilcox

J. W. Barnett, recently Director of the Division of Construction and Finance of the U. S. Shipping Board, has been appointed Assistant Manager of The Babcock and Wilcox Company's Marine Department.

Mr. Barnett was graduated from the U. S. Naval Academy in 1908 and continued in the service until his resignation in 1913. He later became associated, in an executive capacity, with the Lake Torpedo Boat Company and the Marion Steam Shovel Company. He is a member of the Socity of Naval Engineers and of the Society of Naval Architects and Marine Engineers, and has had wide experience in ship design, construction and operation. He joined the staff of The Babcock & Wilcox Company on July 1, 1935.

J. W. Barnett, new marine manager of Babcock & Wilcox in New York.

Colin Thompson, manager for McCormick Steamship Company at Buenos Aires, spent some time during the past month in San Francisco, conferring with officials of the company here.

Robert C. Thackara, chairman of the late United States Intercoastal Conference, who came from New York to San Francisco to testify as rate expert at the Shipping Board hearing at the Merchant's Exchange was unable to attend the March 20 hearing, due to illness. His place was taken by **Zac T. George,** for the past four years freight traffic manager in San Francisco for the Grace line.

Captain Heinrich Carstens, commodore of the Hamburg-American Line's Pacific Coast-European fleet, died aboard his ship, Vancouver, early in March. This voyage was to have been his last, as he planned to retire to Hamburg on a pension at its end.

● Six Captains on Australian Ship

When the Union Royal mail steamer Maunganui sailed from Sydney for New Zealand and San Francisco recently, the commander (Captain Toten) had the unusual experience of entertaining five other captains on his ship.

While Captain Toten was on holiday he was relieved by Captain W. Martin, who was returning to New Zealand. Another former master of the Maunganui, Captain G. B. Morgan, who now commands the Marama, was returning by his old ship to Wellington on leave; and the third ex-master of the vessel, Captain L. Worall, who has now retired had been holidaying in Australia.

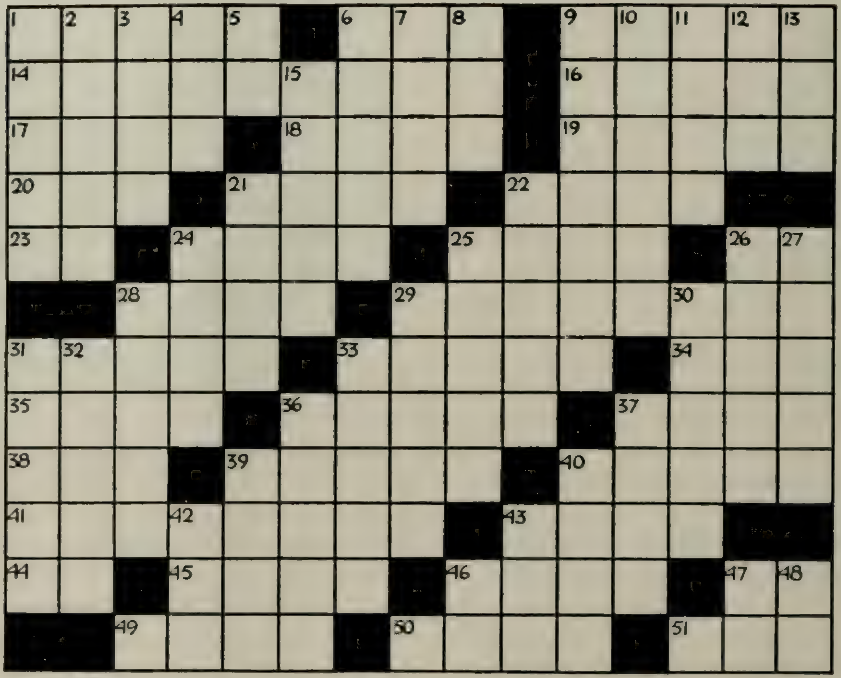
The chief officer of the Maunganui, H. S. Collier, also holds a master's certificate. Another captain, Captain J. Bruce, master of the Union freighter Kiwitea, was going to New Zealand for orders. — Australian Press Bureau.

Impressive services closed the career of **William B. Hamilton,** veteran of the United States Customs for nearly half a century in San Francisco, when, following the traditional "ashes to ashes" passage repeated by a chaplain of the United States Navy, his ashes were cast to the winds forever blowing through the Golden Gate, where for so many years he loved to watch the proud prow of an incoming ship cut through the haze at the harbor entrance.

An Original Pacific Marine Review Cross-Word Puzzle

HORIZONTAL

1. You'll find one on the Pan-Pacific Line house-flag.
6. Where the Bone's in her Teeth.
9. Big intercoastal line.
14. This will take you across the ocean blue.
16. A man who saw red—and liked it!
17. What—no ladies!
18. What the sick Limey did in the Pub.
19. What Laughton did in Mutiny on the Bounty.
20. Atlantic-European Dispatch (Init.).
21. Name of Hearst writer.
22. Dad rode this in the 90s.
23. Period of time (ab.).
24. Pilots cuss it—when docking the big fellas.
25. Gambling game.
26. The beginning of a streamlined motor ferry.
28. You'll find these in the engine room.
29. The kleptomaniac has these kinds of ways. (We stretched a point here.)
31. Trim ship smartly lads, so you'll be on the ——.
33. What the teredos did to the piling.
34. A conjunction.
35. To state.
36. More exposed.
37. Every good poker game starts with this.
38. The beginning of a docking place.
39. The Kaiser's frustrated objective.
40. Pronoun.
41. This is penetrating.
43. A glass on the waterfront.
44. Royal Service (Init.).
45. How cocoanut becomes copra.
46. A pair.
47. You'll find this on page 2.



We surmise that many of our readers are still x-word addicts. Commuters, ahoy! Likewise those of us who like to figure 'em at home while the radio is booming—or "the little woman" is bathing the dishes. Give this one a whirl—and send in your solution! We'll give one-year subscriptions to the first ten readers who send in correct answers. If we get the slightest encouragement, we'll run one of these "work-outs" in every edition.

47. They crossed the Red Sea without a Ship.
50. Surname of Tom and Rock.
51. Initials of this puzzle-author.

VERTICAL

1. A treatise.
2. A flower.
3. Happy.
4. What the Bos'n called the mate (behind his back).
5. Comparative ending.
6. Sea-going coffee.
9. Spread with viscous substance (Where's that dictionary!).
10. What navigating officers do.
11. Same as No. 37 horizontal.
12. A French company.
13. Every voyage comes to this.
15. Praises.
21. First of the month harbinger.
22. You'll find him in the galley.
24. A row on the wharf.
25. Taxi riders.
26. Nautical distances.
27. To go along with.
28. A bad act.
29. What the sailors went aloft to do (double word).
30. Inside stuff.
31. Tardier.
32. If the odds are against you, you'll get these.
33. Cow garages.
36. Minnows and salmon eggs.
37. A warning cough.
39. No 6 (Hor.) in four letters.
40. Afternoon affairs where they serve everything but!
42. Before.
43. This is the bunk.
46. Half of a big Seattle drydock.
47. Article.
48. "The yanks are coming!" (Init.)

Metallic Condenser Packing

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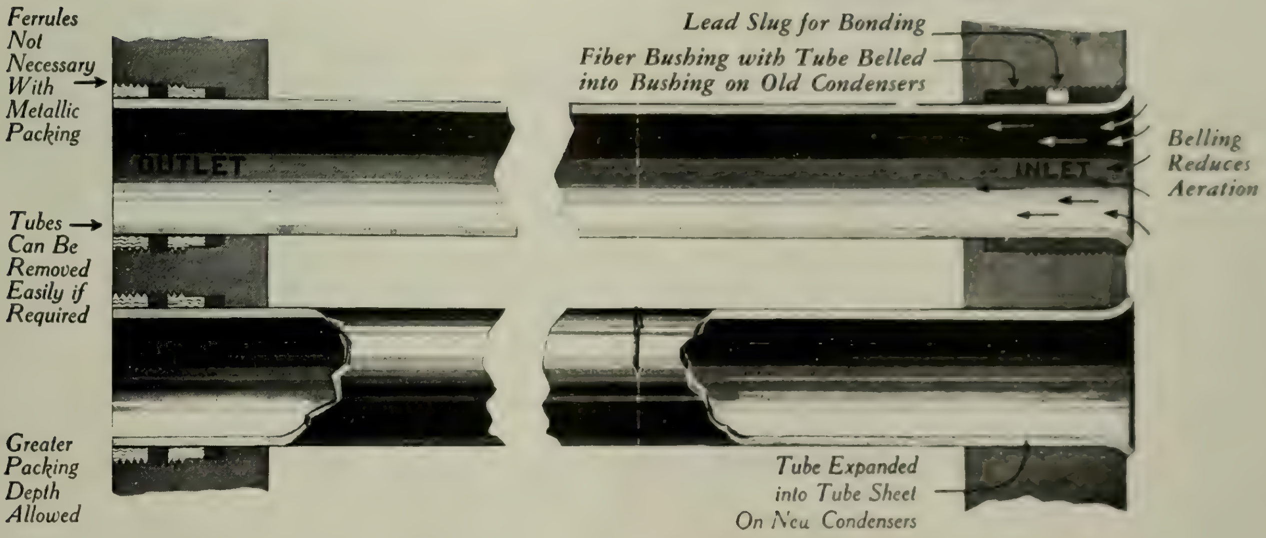
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New England Steamship Company
Ore Steamship Company
Penn Shipping Company
Merchants and Miners Transport Co.
Lykes Bros. Inc.
Mississippi Shipping Co., Inc.
Ripley S. S. Inc.

WEST COAST MARINE INSTALLATIONS:

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Matson Navigation Company
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Union Oil Company
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Associated Oil Company
Pacific Steamship Company
Nelson Steamship Company
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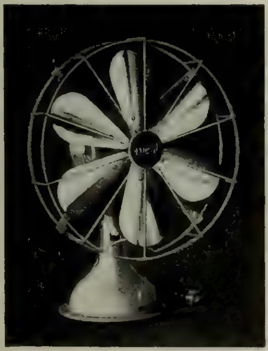
has for the past 50 years specialized in the manufacture of strictly all metallic packings designed individually to suit operating conditions of steam, air, liquids, etc. Only the finest of materials and workmanship enter their construction to eliminate friction and rod wear.



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● Propeller Club on Marine Legislation

(Continued from Page 23)

operation due to excessive overhead imposed.

(d) Would deprive qualified men who have operated small craft all their lives from earning their livelihood in the manner for which they have been trained.

(e) An officer who has stood his watch at sea would be precluded from taking his station to tie up the ship on arrival at any port.

(f) Would preclude an officer who has stood his watch from taking necessary sights in connection with his navigation duties.

H.R. 6202

Every inspected vessel shall have on board and in service 1 duly licensed master and 1 duly licensed chief engineer.

Every such vessel of over 1,000 gross tons shall have aboard and in service 3 licensed mates and 3 licensed assistant engineers who shall stand in 3 watches.

Every such vessel between 200 gross tons and 1,000 gross tons, when in service for a longer period than 16 hours in any 24 hour period, shall have 2 licensed mates and 2 licensed assistant engineers, who with the master and chief engineer shall stand in 3 watches.

No licensed officer shall be required to remain on duty more than 8 hours in any 24 hour period.

Licensed officers shall have had at least 6 hours off duty within the 12 hours immediately preceding sailing time.

No licensed officer shall be required to do duty in excess of 8 hours in any 24 hours while in port, including date of arrival, nor more than 8 hours of any 24 while being navigated, except in case of emergency when life or property is endangered.

This bill is inconsistent and places a burden on operators for the same reasons as outlined in our comments relative to the preceding bill, i.e. H.R. 7319.

H.R. 8599—Re: Gibson Amendment—

We oppose this amendment upon the grounds that it seeks to transfer jurisdiction over seamen from the Department of Commerce to the Department of Labor. For reasons of safety the Department of Commerce should retain jurisdiction over unlicensed as well as licensed members of the crew. The Department of Commerce is the logical Department to exercise jurisdiction over maritime personnel. The division of authority among several governmental departments would result in confusion and loss of efficiency.

We oppose the assignment by the Treasury Department of Coast Guard officers to inspect vessels at sea as unnecessary because this is a service already adequately performed by the Department of Commerce through the medium of the Bureau of Navigation and Steamboat Inspection.

We respectfully request that the foregoing views which are those of a representative group of citizens vitally interested in the general welfare of the nation and development of its commerce be given recognition by your Committee.

Thanking you for such consideration, we are,

Very truly yours,
PROPELLER CLUB OF CALIFORNIA

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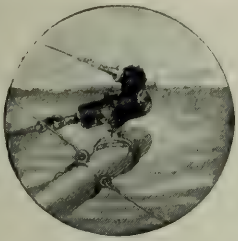

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After being graduated from the University of California in 1927 where he majored in economics, Mr. Schwobeda entered the United States army air corps, resigning from active service two years later to engage in the investment business in San Francisco.

In June, 1930, he became a member of the Fireman's Fund head office staff, handling miscellaneous casualty lines, where, because of his interest in and ability as a bonding underwriter, he was soon assigned to underwriting duties in the bonding and surety department.

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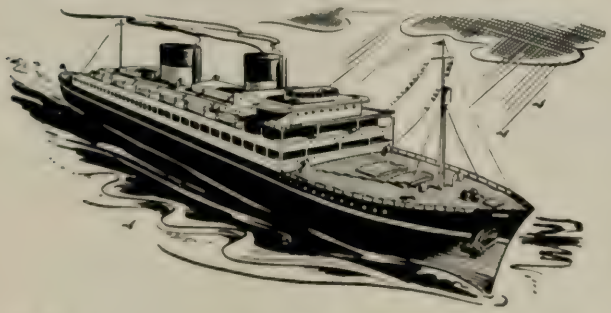

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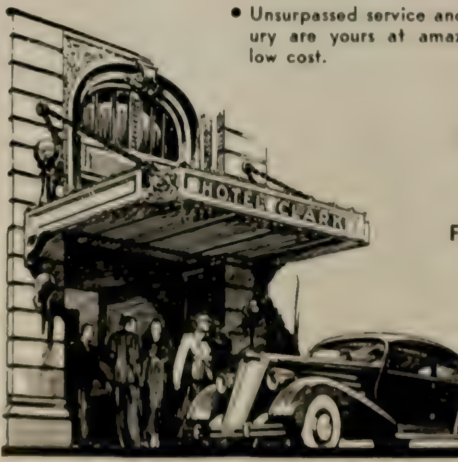

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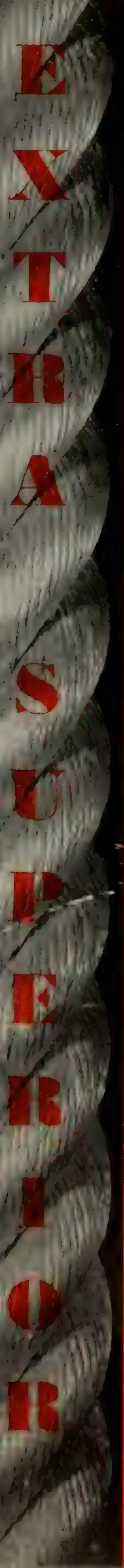

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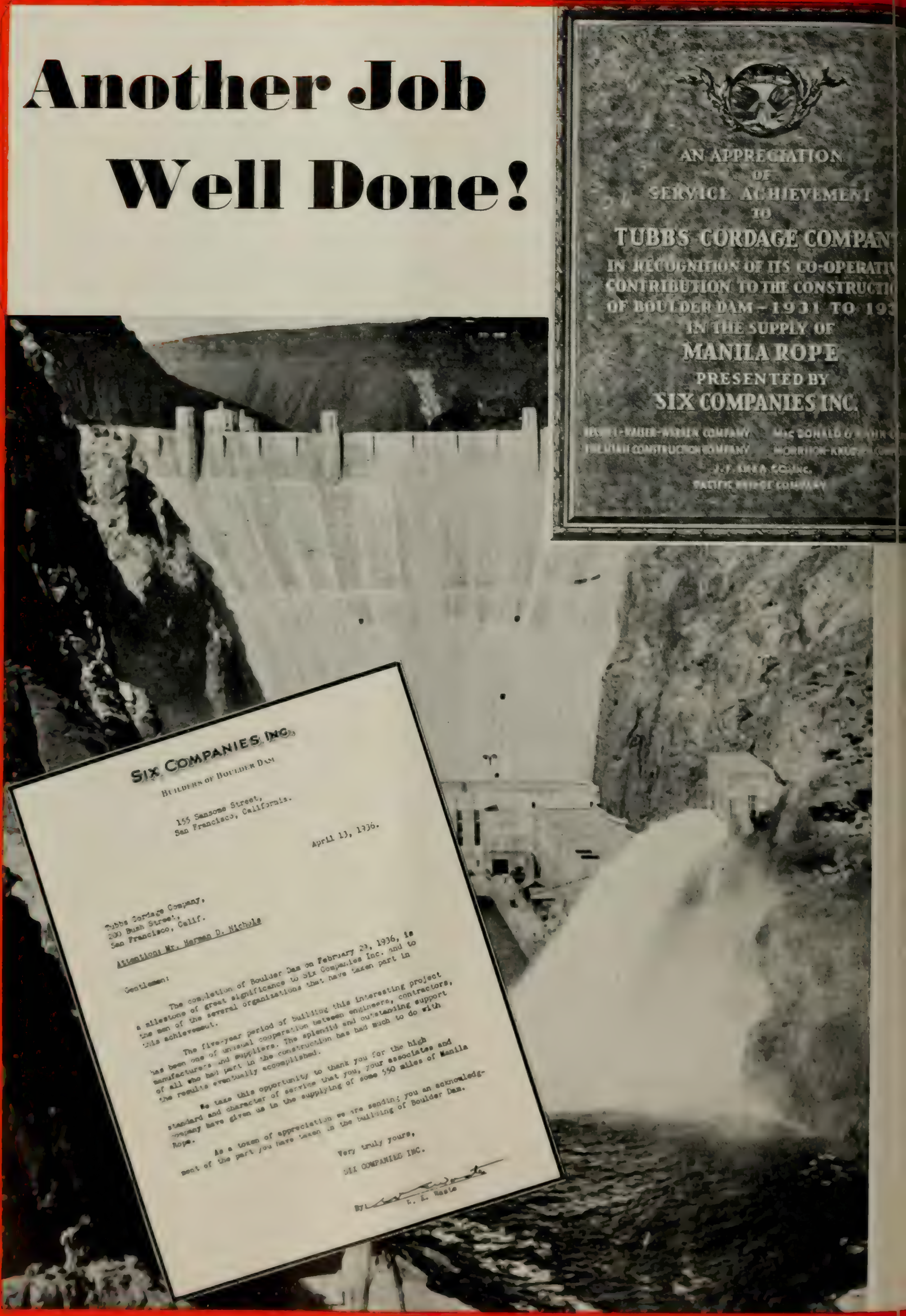

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PACIFIC MARINE REVIEW

MAY, 1936
VOL. XXXIII NO. 5

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ERRATA

In our April issue on page 124, at the end of the article describing four tankers building at the Sun Shipbuilding and Dry Dock Company, we described the **Butterworth System** of tank cleaning to be installed on these vessels. This material having come in as the book was on press, it was inserted hurriedly at the last minute, and an error in figures slipped through for which we apologize and make correction.

The clause reading "in sufficient quantities to supply each nozzle in use with approximately 500 gallons a minute," should have been printed "in sufficient quantities to supply each nozzle in use with approximately **90** gallons a minute."

PUBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

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PACIFIC MARINE REVIEW

VOLUME XXXIII MAY 1936 NUMBER 5

Editorial Comment »« »«

Revival in American Shipbuilding

On April 1, 1935, there were building in American shipyards, 48 commercial vessels, aggregating 28,237 gross tons. On the same date, in 1936, American shipyards had under construction 119 commercial vessels, with a total gross tonnage of 165,870. This represents an increase in tonnage of well over 400 per cent and the revival has just started.

These contracts include 13 large tankers, with an aggregate gross tonnage of 109,755 tons, 29 oil barges with an aggregate gross of 19,810 tons, 6 ferries, five tugs, and a varied lot of smaller craft.

The naval construction program in commercial shipyards includes 3 aircraft carriers, 2 heavy cruisers, 5 light cruisers, 7 submarines, 12 destroyers of 1850 tons each, and 15 destroyers of 1500 tons each, or a total of 44 naval vessels, approximating a total displacement of 140,000 tons.

Putting these two programs together, we find that the total of new construction in privately owned American shipyards today is 163 vessels with an aggregate gross measurement for merchant, plus displacement for naval, of over 300,000 tons.

In addition to this, we must consider the navy yard construction program, which includes one heavy cruiser, 4 light cruisers, 7 submarines, 25 destroyers of 1500 tons each, and 2 gun boats or a total of 39 vessels with an aggregate total displacement of 115,000 tons.

This is a very respectable shipbuilding program in any country, and it is doing its bit in hastening the return of prosperity through the profitable work it gives directly and indirectly to thousands of skilled artisans. The best feature of this revival is its stability. It is no flash in the pan. These vessels, both commercial and naval, are needed, and many others like them.

If Washington will give the American ship operator a definite, forward-looking, long-time, settled policy toward which he can work, there will be orders forthcoming to keep our shipyards busy for years.

The naval auxiliary bill now pending calls for 54 non-combatant naval vessels and specifies that at least 50 per cent be built in commercial yards.

American oil companies have need of many more tanker replacements in the very near future.

The great majority of American cargo vessels are obsolete, and severely handicapped in foreign trade competition with the more modern and speedier, as well as more economical carriers operated by other nationals.

In this revival, unless it is stopped by some very unfavorable legislative action, the Pacific coast commercial shipyards are due to share. At the present writing, their sole participation is made up of two 1500-ton destroyers at the Union Plant of Bethlehem. This amounts to 1 per cent of the total tonnage now building in American privately owned yards.

On the bases of its shipowning and its production of foreign and domestic waterborne trade, the Pacific coast is entitled to 25 per cent of any general shipbuilding program, and certainly to that much or more of an oil tanker building program.

The Pacific coast navy yards, of the naval work outlined above, got 8 destroyers of the 1500-ton class, or 12,000 tons, which is a little more than 10 per cent of the total navy yard work for the United States.

On the basis of national defense, and in view of present world conditions, the Pacific coast ought to get 50 per cent of any immediately pending American naval shipbuilding program.

Those charged with the national defense should make it their definite policy to build up the naval facilities on the Pacific coast to the highest efficiency, and they should include in this policy, all privately operated shipyards, since experience has shown these to be an absolute necessity in time of emergency.

In the American tanker fleet there are 236 tankers 16 years old or over, and among these are 83 ships 21 years old or over. The average life of a tanker middle body is less than 15 years.

Twenty-Five Years Ago

Number 5, Volume VIII, of Pacific Marine Review, published in Seattle, May 1911, record several interesting items of shipping and shipbuilding progress, not only on the Pacific coast, but throughout the world. Among these are:

Good progress on construction of the German super-liner Europa, on which, as he went to press, the editor had received the following report: "Please take notice that the name of the largest ship in the world, now building for the Hamburg-American Line at Hamburg, tentatively called S.S. Europa, has been changed to S.S. Imperator. The Imperator will be completed in 1913." This vessel, under reparations, came to the British, and is now the Cunarder, Berengaria.

The Moran yard at Seattle was building five submarines for the United States navy, and the Union Iron Works, San Francisco, was building four. Commercial steel shipbuilding was almost nil on the Pacific coast.

The Wireless Ship Act was to be enforced on and after July 1, 1911, and all vessels equipped with wireless were advised to send wireless messages to the Department of Commerce and Labor through any naval wireless shore station "that shall be at the time at least 100 miles from the sending ship." These messages were to contain name, nationality, position of ship, and names of wireless operator and of master.

The Pacific Mail had closed an agreement with the Submarine Signal Company for the equipment of nine of their vessels with submarine signal receiving apparatus. This order included the trans-Pacific passenger and cargo steamships, Korea, Siberia, Manchuria, Mongolia, China, Persia, and Asia, and the coastwise passenger and cargo steamers, Bear, Beaver, and Rose City. Unfortunately, Asia "was lost before an opportunity was had to install her equipment; apparently from the very cause which the latter was intended to overcome—fog." These installations brought the Pacific coast fleet up to 25 vessels equipped with the apparatus for detecting the direction and distance of a shore station sending sound signals through the water.

The lead editorial commented on the Alaska situation thus: "Press dispatches from Cordova indicate a state of rebellion against existing laws. . . . Owing to ultra-conservative policy as maintained by the federal government due to the influence of one Pinchot, the inhabitants of Alaska are prohibited from making use of the natural resources, particularly the coal deposits, and are compelled to use coal imported from a foreign country on which there is a duty. . . . The citizens have shown that the old Yankee spirit is not yet dead, and that the independent American will not patronize foreign products on which he must pay a duty when natural products of his own country lie unused close at hand."

That the Panama Railroad and its connecting steamship lines were, as now, operated by the Panama Canal authorities (then builders) were matters of grave consideration by thoughtful steamship operators. The May, 1911, edition recorded that as of May 6, 1911, "R. P. Schwerin, vice president and general manager, Pacific Mail Steamship Company, informs us that 'no contract has yet been entered into between the Panama Railroad Company and the steamship lines operating between Balboa and Pacific coast ports'."

We noted also that:

"Ship, Glory of the Seas, was sold at a marshall's sale, Victoria, B.C., for $4050." This was the justly famous American clipper, last merchant vessel built by that wooden ship genius, Donald McKay of Boston.

In 1911, the Engineering Bureau of the United States navy was under considerable pressure because they had decided to use reciprocating engines instead of turbines for two new battleships—New York and Texas. Pacific Marine Review expressed the opinion that as soon as turbine reduction gearing—then in experimental form, so far as large powers were concerned—had proved a success, the U. S. navy would adopt turbine drive for all its large sea-going units. This opinion has certainly been amply justified by the experience of the navy since that time.

We close this retrospect with a quotation over which we have had many chuckles:

"*Progress in Motor-Driven Steamships.* Rapid progress is being made in Europe in the application of the internal combustion engine as the motive power of ocean going *steamships.* Already a freight *steamship* over 1000 tons, carrying this type of motive power is afloat and in successful operation, and several others, ranging from this size up to the big 9000-ton *steamer* under construction for the Hamburg-American line, are being built and within less than 12 months time will probably be in service. "*Within a year and a half from the present writing, the question of the substitution of the internal combustion for the steam engine on ocean steamships of large size will be fairly well settled.*"

"I looked behind to find my past, and lo—it had gone before."

Longfellow.

Maritime Authority is America's Need

Any intelligent observer of the present conditions affecting the American Merchant Marine must be greatly impressed with the need of some voice of authority that shall be respected by all parties concerned and that shall give some assurance of continuous constructive federal policy. There is great difference of opinion among the various interests as to many details concerning the organization, functions, and duties of such an authority, but a unanimous opinion that some authority is necessary.

From the standpoint of Safety at Sea, the prime need on shipboard is proper discipline and morale among the officers and crew. The best way to insure this condition for the entire merchant marine is to maintain at the top the discipline and morale of an orderly progressive policy. This can be done only through a maritime authority which will with fully recognized responsibility supervise the desirable adjustments and controls.

From the standpoint of the shipowner, as an investor of capital, the great handicap is uncertainty of future policy. His investment must be amortized with profits in a period of twenty years or less, which is a rather short time for conservative investors. He faces on the present federal set-up, a possible complete reversal of policy five times during the twenty years. He also faces the constant personal and political jockeying of four or five federal bureaus each of which has more or less limited contral over matters affecting both principal and earnings of his investment. From the shipowning, investment standpoint, the maritime authority, combining all control of merchant marine matters under one responsible agency, would be very desirable.

The ship operator, also, would greatly benefit by this unification of control and by the possibility of a more stable federal policy maintained for longer periods.

The employed merchant marine personnel afloat and ashore would certainly benefit from the establishment of such an authority. Employment would be more stable. Working conditions, afloat and ashore, would become more uniform and much improved. Disputes in arbitration would receive more intelligent and more prompt attention.

Shippers, too, would benefit from a greater stability of rate structure, improved sailing schedules, and—in the long run—more modern and more efficient ships and terminals.

All of these effects and many more would accrue to the American merchant marine and the people of the United States much more rapidly and much more efficiently under a non-political maritime authority than under the present jumble of federal departments and bureaus, each of which has just enough authority to be often a decided "pain in the neck" to the harassed ship operator, and none of which has enough authority to authoritatively settle any of his major problems.

There is now considerable hope that the several features common to all merchant marine bills in the Senate may be combined in one bill, and passed at this session. Since the idea of the maritime authority is in each of these bills, we are fairly close to this highly desirable consummation.

J. Harold Dollar Passes

The American Merchant Marine as a whole and many individual merchant mariners on both sides of the Pacific ocean have lost a very good friend in the untimely passing of J. Harold Dollar at the St. Francis Hospital, San Francisco, on April 6.

As president of the Pacific Steamship Lines, first vice president of the Dollar Steamship Company, and vice president of the American Line, Mr. Dollar was one of the most prominent steamship operators in San Francisco. His funeral, April 9, was at the First Presbyterian Church of San Rafael, California, where the family was wont to worship. The church was crowded to the doors and a large company overflowed to the steps and lawn outside. During the service, all Dollar steamships throughout the world stopped and maintained a five minute period of silence.

The active pall bearers at the service were Dr. T. I. C. Barr, R. W. Crosby, T. J. Cokely, Keith Ferguson, Donald Guthrie, and A. Richard Tissot. Honorary pallbearers included Hugh Brittan, Dr. R. William Barr, Robert Barr, Arthur B. Cahill, H. C. Cantelow, Dr. W. B. Coffey, A. B. Coutts, Fred Dickson, Herbert Fleischhacker, Mortimer Fleischhacker, John F. Forbes, E. N. Greenwood, Charles Gettemy, Walter Haas, E. T. Kruse, Peter B. Kyne, Angus MacDonald, Parker S. Maddux, George Murray, William P. Murray, Capt. Neil Murchison, William P. Roth, Raymond Thayer, Chris Sturm, W. E. Thompson.

Born in Michigan at the town of Marquette on October 7, 1887, Harold Dollar came to California as a baby, the family having moved to San Rafael in the fall of 1888.

After an education in the California schools and in the Dollar offices at San Francisco, Harold Dollar went to the Orient, where he rapidly rose to be chief executive of the widespread Dollar interests in China.

In 1907 Harold Dollar married Miss Agnes Barr of San Rafael who survives, together with four children—Robert Dollar, age 23; Alice, 18; J. Harold, Jr., 16; and Virginia, 14. He is survived also by his brother, R. Stanley Dollar, and his mother, Mrs. Robert Dollar.

GEORGE W. CODRINGTON,
President, Winton Engine Corporation.

. . . . Refinements

In Modern Workboat Diesels

Winton Engine Corporation Introduces Noteworthy Improvements in Diesel Engineering

A recent trip through the plant of the Winton Engine Corporation in Cleveland, Ohio, portrayed vividly the remarkable advances which are now being effected in designing and building diesel engines for all kinds of service. Especially interesting is the fact that Winton engineers have devoted much time and thought to the improvement of diesel power plants, designed for service in various classes of work boats. Reduced weight and size, without any sacrifice in strength and durability, are quite apparent in Winton's latest units for such work.

George W. Codrington, able and progressive president of the Winton Engine Corporation, grew up in the workboat field and undoubtedly his early training has had a marked bearing upon the progress effected by his company in designing and building diesel engines, which satisfy the exacting demands of modern workboats of all kinds.

As any practical workboat operator will tell you, it is one thing to approach the problem of designing an engine from the pure technical or engine standpoint and quite a different thing to come to the task with a comprehensive knowledge of the practical difficulties and problems which a power plant encounters, in actual service. To his outstanding success in striking a happy medium between pure theory and the demands of progress in practical application may be attributed in a large measure George Codrington's standing among America's foremost diesel engine executives.

Efficiency of U. S. dredge Pullen was greatly increased through the modernization of her power plant with an 835 horsepower Winton diesel.

Late Winton models for workboats present nothing startling or radical in design. They do, however, show marked advances in refinements, which only years of concentrated attention could produce. Winton's standing in the workboat field is well-known on the Pacific Coast, but some of this company's recent activities will undoubtedly prove interesting.

The range of Winton-Diesel engines includes models for tankers, towboats, dredges and freight boats of all types. All inclusive Winton-built auxiliary equipment, such as generators, pumps and compressors, completely rounds out the line. An engine room equipped with Winton main engines and auxiliaries, all designed to function together smoothly, places the responsibility with one engine builder, practically insures no loss of time in operation, and reduces to an absolute minimum costly idle time incurred for lay up and repairs.

Winton-Diesel engines are powering the workboats of many of the largest and most prominent firms operating in the commercial field as well as a constantly increasing number of Government vessels.

The Texas Company, operating a fleet in southern Louisiana waters for towing oil barges, has four boats equipped with Winton-Diesel engines. The Houma, overall length 80 feet, is powered with a 430 horsepower engine at 275 revolutions per minute. The Barre and Caillou, each having an overall length of 70 feet, are equipped with engines rated at 250 horsepower at 375 revolutions per minute. The Leesville, 60 feet long, is powered with a 180 horsepower engine at 425 revolutions per minute. The hulls for these four boats were built and equipped by The Pennsylvania Shipyards, Inc.

A fleet of eight 44-foot launches, owned by The Standard Shipping Company and built from designs of the owners by Jakobsen and Peterson are powered with 100 horsepower Winton diesel engines. This fleet is now used by The Largo Petroleum Company on Lake Maracaibo, Venezuela.

U. S. Engineers' towboat Coiner has a complete Winton power plant generating a total of 1600 horsepower.

Above: The tug George Levingston is powered with a 350 brake horsepower Winton diesel. Below: The tug Houma, owned by the Texas Company and operating in Louisiana waters, is powered with a 430 brake horsepower Winton diesel.

The Motorship Peace, 160 feet molded, built for the Union Barge Line by The Dravo Contracting Company, is powered by two six-cylinder, direct - reversible, solid - injection, Winton-Diesel engines each developing 375 horsepower. Auxiliary power is provided by two 8-inch x 10-inch Winton-Diesels, each driving a 50 kilowatt electric generator.

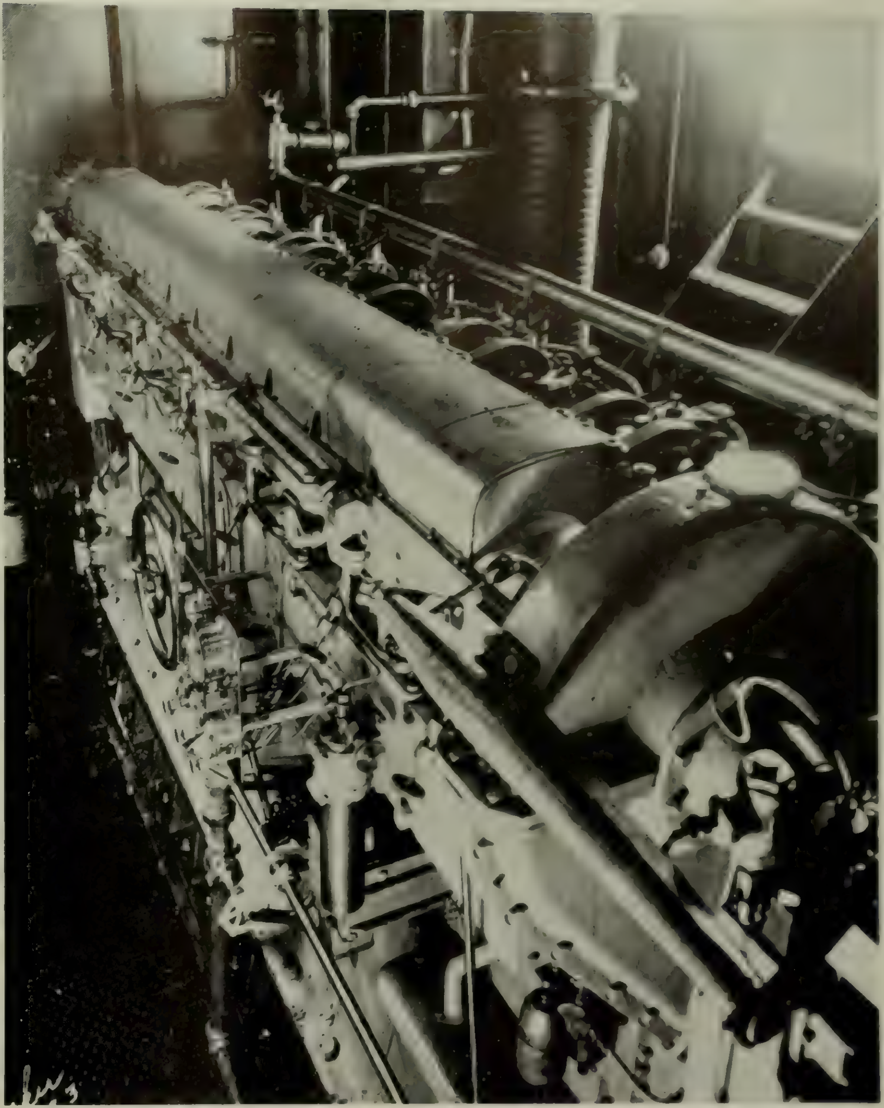
The William T. Warner, overall length 99 feet, built by Wolf River Transportation Company and chartered by the Inland Waterways Corporation, is equipped with a 600 horsepower Winton-Diesel engine. The George Levingston, overall length 65 feet, 9 inches, owned by Wm. T. Burton and built by Levingston Ship Building Company, depends on a 350 horsepower Winton-Diesel engine for reliable power.

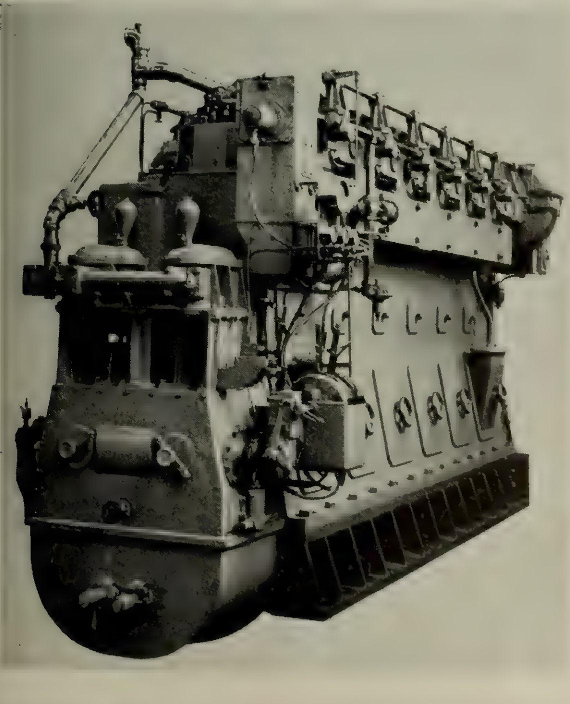
The U. S. Engineers' towboat Coiner, built by The Marietta Manufacturing Company, is an outstanding example of a complete Winton installation. Its power plant consists of two Winton-Diesel main engines of direct-reversible type, each developing 650 horsepower at 250 revolutions per minute and three compact Winton-Diesel generator sets, two developing 75 kilowatts and one 15 kilowatts.

Each of nine U. S. Coast Guard Patrol Boats recently launched is powered with two six-cylinder, valve-in-head, solid-inpection, four-cycle, direct-reversible Winton-Diesel engines, each developing 670 horsepower at 450 revolutions per minute. Manitowoc Shipbuilding Corp., Marietta Manufacturing Company, and Lake Union Dry Dock & Machine Works, each built three of these Coast Guard boats.

The efficiency of the U. S. Dredge Pullen, 130 feet long, constructed by the American Brown Boveri Electric Corporation, has been greatly increased through modernization with an 865 horsepower Winton-Diesel engine.

These are but a few of the scores of commercial and Government Winton-Diesel installations. Having pioneered in the development of the diesel-type engine for workboats, Winton enjoys an enviable reputation in this field.

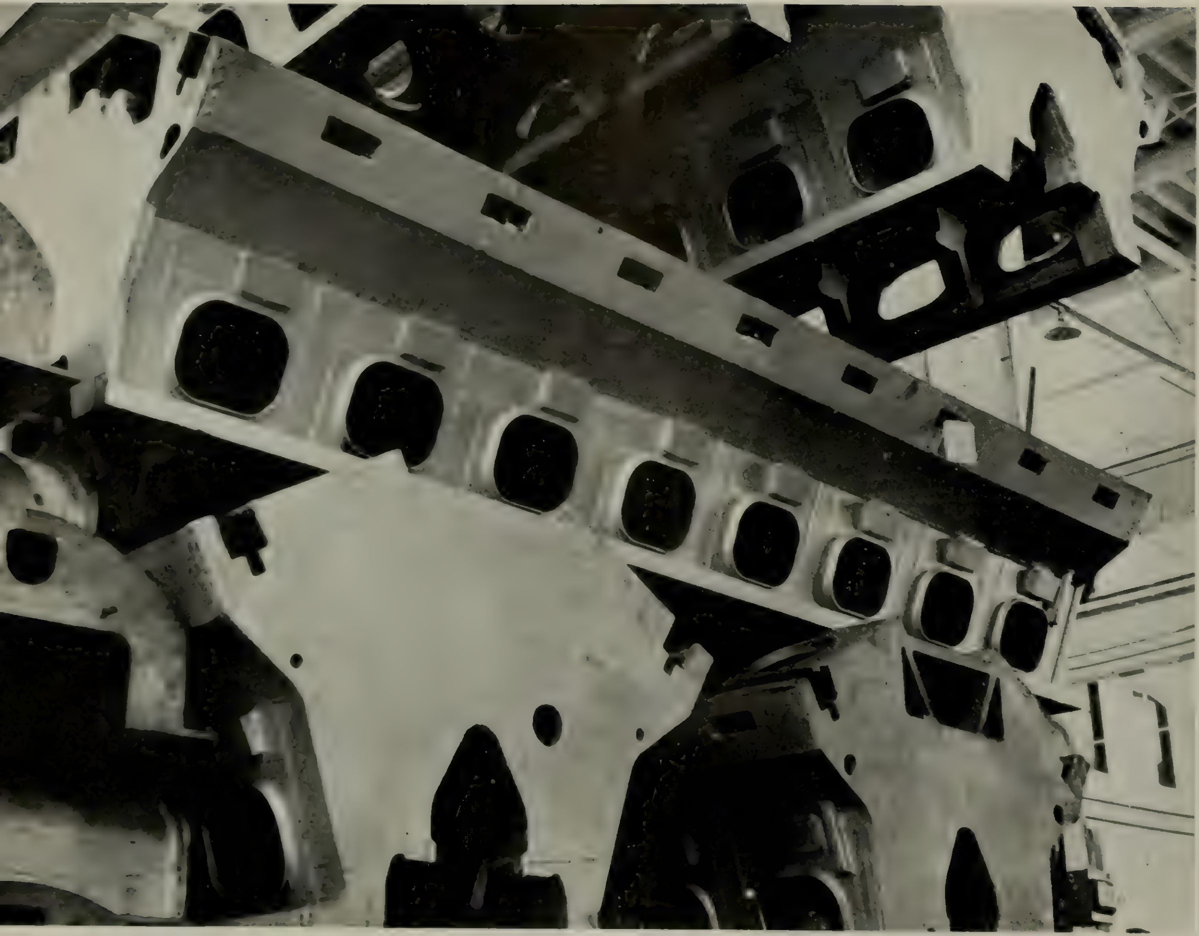




Two examples of the sturdy Winton diesel engines that power many American tugs.

Above: Engine room of the George Levingston with its 350 b.h.p. Winton diesel.

At left: The 430 b.h.p. Winton diesel that drives the tug Houma.



Stack of welded steel frames for V-type Winton diesel engines.

(Photo by Jas. S. Hines, Publisher Pacific Marine Review.)

The workboats Houma and George Levingston have now been in actual service for several months, a period long enough to prove their remarkable ability to perform the exacting duties for which they were built. Both of these boats are operating in southern Louisiana waters towing oil barges.

The Houma, owned by the Texas Company, is one of a fleet of four Winton-powered boats working in this area. Reports reveal that it takes a 15,000-barrel barge from Port Texaco No. 2 to the oil tankers in the gulf, a distance of approximately nine miles, in one and a half hours. When two barges, of the same capacity each, are towed, the trip is made in two hours.

The George Levingston, owned by W. T. Burton, Esq., has been towing from Castle Mills, located north of Lake Charles, Louisiana, to Houston, Texas, a trip covering approximately 180 miles. Handling three 10,000-barrel barges loaded to capacity the trip is completed in approximately fifty four hours. Two barges are handled in forty-eight hours, and one barge in forty one hours. Return trips, with a light barge, are made in twenty-four and a half hours. Mr. Burton says that the George Levingston surpasses, for towing and maneuvering, any boat that he has ever had in his service and that its Winton-Diesel engine has consistently operated to his complete satisfaction. This is a very gratifying statement because Mr. Burton has the largest oil handling equipment for inland waterways on the Gulf Coast. It consists of fourteen tow boats, seventy barges, an oil tank farm, a ship loading oil terminal, a pile driving rig, two hydraulic dredges, three clam shell dredges, and a shipyard which he maintains for repairs on his fleet.

The performance record of these two boats is typical of the dependable service that fleet operators secure from their Winton-Diesel powered workboats.

Adding to its long record of performance in Government vessels, Winton power now goes into service in two new U. S. Coast Guard Ice breakers. These vessels were designed by Eldredge-McInnis, Inc., and built by George Lawley & Son Corporation. Their general dimensions are—overall length, 63 feet 6 inches; beam, 19 feet; draft, 4 feet 6 inches. These new ice breakers are heavily constructed with double sawn oak frames and yellow pine planking, and are fitted for the most severe type of service. One of the outstanding features of these boats is their shallow draft. They are to be placed in service at Great South Bay, Long Island, New York, and Norfolk, Virginia, harbors. The task that these ice-breakers must perform is an important one. Keeping ice-bound harbors open and vessels on the move in the dead of winter calls for dependable, never-failing power. To insure such service, an eight-cylinder Winton-Diesel engine, developing 300 horsepower at 700 revolutions per minute, has been installed in each of these ice breakers. Each of these engines is equipped with a belt-driven air compressor of 4½ cubic-feet of free air per minute capacity and a sea water pump with a capacity of 110 gallons of water per minute. In these installations Winton power broadens its service scope to meet exacting demands of the most strenuous nature.

. . . Development of Welded Structures for Diesels

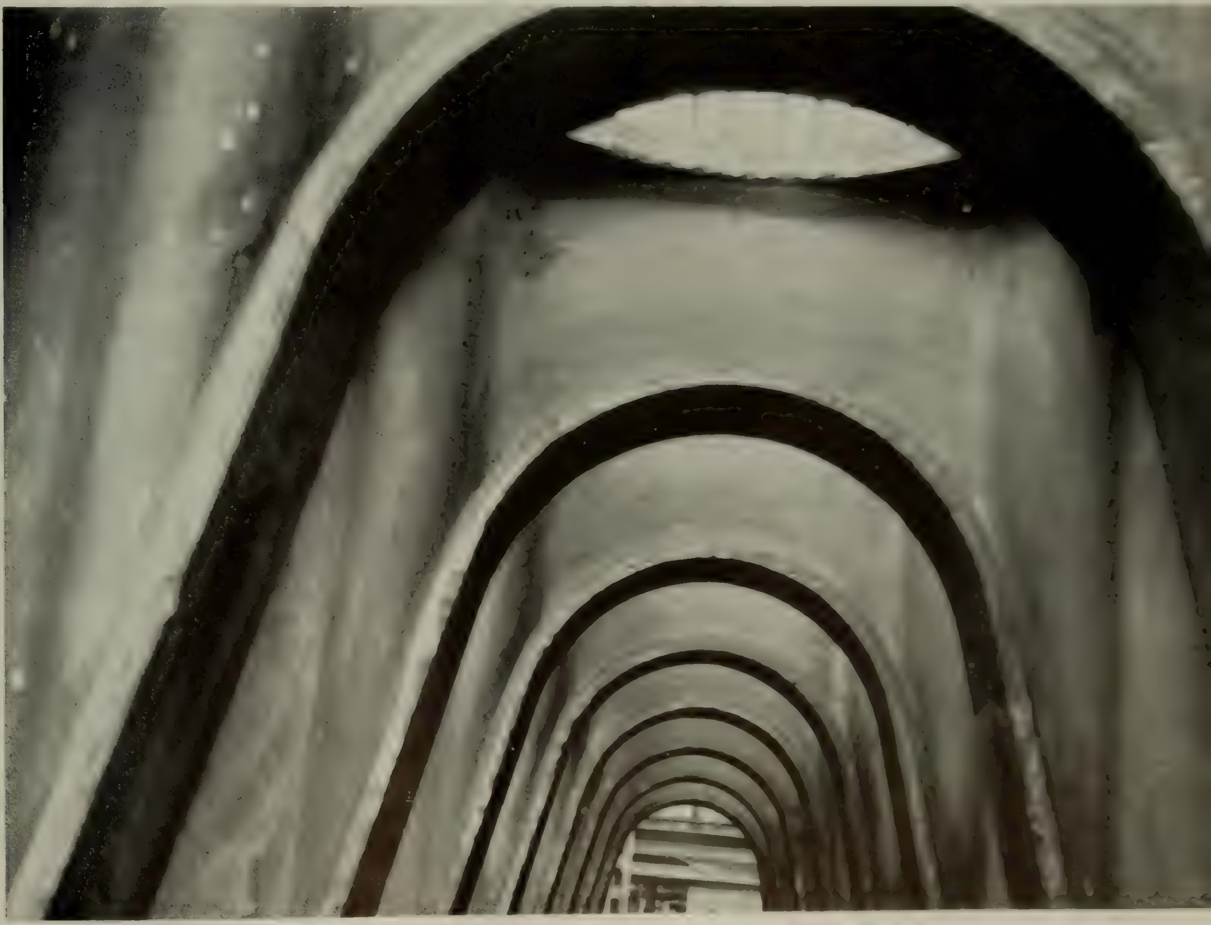
By Everett Chapman

Vice President, Lukenweld, Inc., Division of Lukens Steel Company

Late in 1930, Winton Engine Corporation, Cleveland, Ohio, submitted blueprints of the top and bottom halves of a Winton Model 138 diesel engine to Lukenweld, Inc., with a request that the structures be considered for re-design in welded steel, with a view to eliminating breakage of cast sections that had occurred in the past, and also to effect any reductions in weight that might be feasible.

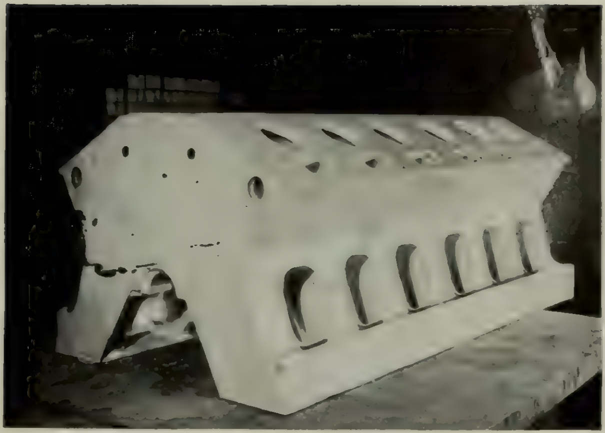
Designs were submitted to Winton, and in March 1931, an order was placed with Lukenweld, Inc., for welded steel samples of the two components. They were delivered in May 1931, machined in the Winton plant, and placed in service in an experimental power house engine which supplied part of the current for operation of the Winton plant. This engine, with its pioneer welded steel frame, has been in continuous operation up to the present time, without developing trouble of any kind. Its service record to date has been entirely uneventful. It is believed that these welded structures comprise the first welded steel diesel engine frame in the world in which the gas load from the cylinder head and the crankshaft were tied together through a weld. In this original crankcase, the welds have withstood over 1,000,000,000 applications of the sharp impact load which is characteristic of the diesel ignition cycle. In principle, the construction followed the design of the old cast iron parts, although the metal sections were considerably reduced and bent sections, forming a double box section, were used to support the main bearings. Some slight reduction in weight was made over the original design.

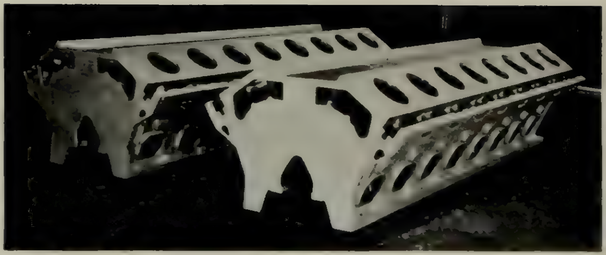
The next step was undertaken in November, 1931 when order was received from Winton for the construction of a complete block which extended from below the cylinder head down to the main bearing, and as such, included the water box. The



Interior view of welded steel crank case frame for a Winton straight eight type diesel engine.

(Photo by Jas. S. Hines, Publisher Pacific Marine Review.)





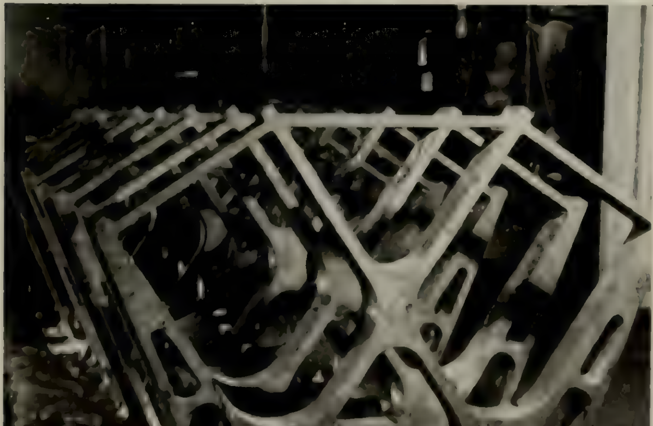
Above: Welded assembly of frames and cylinder blocks for Winton V-16 U. S. submarine diesels. Left: Welded assembly of frame and block for Winton V-12.

rod construction was reverted to, since faith in welds at that time was not sufficiently developed by experience. Due to the complication of running the enclosing columns for the tie rods through the water box proper, coupled with the lack of experience in producing clean welded designs, this particular block leaked so badly that it was entirely unusable. Leaks were found in every conceivable corner and in every conceivable direction. Forty pounds pressure on the water box produced the most chaotic sprinkling system imaginable.

In spite of this distressing failure, George Codrington, president of Winton Engine Corporation, had sufficient vision to see the possibilities in welded steel diesel engine crankcases. He not only undertook the construction of two more welded frames but warned everyone concerned beforehand that these engines were to be installed in his yacht Victoria, and they had to work! These engine frames were ordered on August 1, 1932, and shipped on September 10, 1932. Again the tie rod construction was retained and in view of the salt water service in which the engines were to be employed, the upper half of each engine was completely galvanized. These engines have been in service since about October, 1932, and frequent overhauls showed the structural parts of the engines to be in perfect condition for further service. In the weight of the crankcases of these engines, a saving of about 20 per cent was effected with welded steel construction.

Order for two additional engines of the same type was placed on November 7, 1932, and shipment of the frames was made on December 7, 1932. They embodied the two-cycle principle and were to be used to supply current for operation of the General Motors Building at A Century of Progress in Chicago. These engines functioned through duration of the fair and the welded structures served with entire satisfaction.

At about that time, the idea developed that full dependence should be placed on the welds, with a view to achieving drastic reductions in weight and simplification of the entire construction of the crankcases. In place of tie rods and columns it was suggested that flame-cut load-



Above: A close-up view of latest development in welded steel crank case frame for Winton diesels. Left: A group of flame cut tension load members for a type V-16 Winton diesel.

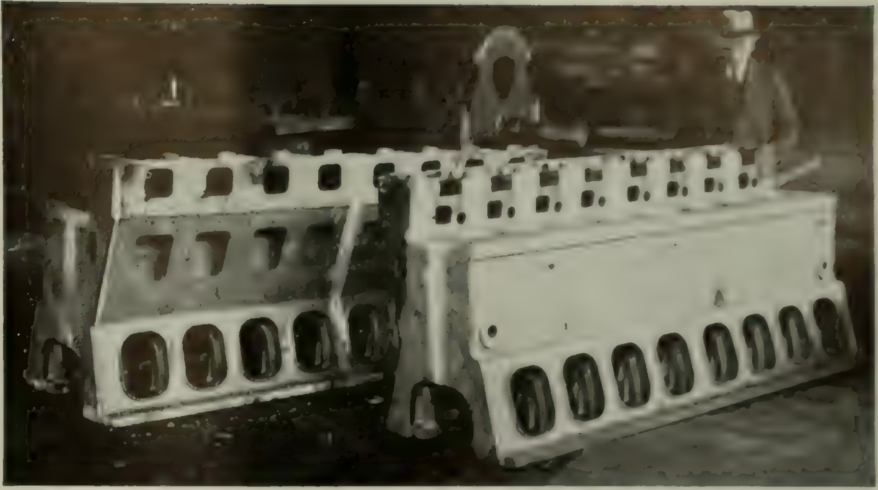
transmitting members be welded into the structure.

The navy decided to develop commercial diesels in this country for submarine service and granted six contracts for experimental engines to as many different companies. The Winton design was decided upon as a 12-cylinder vee-type two cycle engine running at 720 revolutions per minute, and employing 8 inch x 10 inch pistons. In view of the difficulties of transmitting, by tie rods, the gas load of one bank of cylinders past the gas load of the other bank of cylinders, to the common reaction point, the crankshaft, and because of the favorable comment that the flame cut load transmitting member design had received, it was decided to proceed with manufacture of this crankcase in a solidly-welded construction, utilizing flame-cut shapes in which full dependence was placed upon the welded joint.

Again, George Codrington, president of Winton, had the vision and courage to gamble on an utterly new type of construction and on a contract where success was vitally essential to the welfare of his company. The working load on this joint was in the neighborhood of 9,500 pounds and the joint itself failed as shown at 212,000 pounds. The first navy experimental submarine engine frame, ordered on February 20, 1933 was shipped on April 16, 1933. The weight of this crankcase was reduced to 3,100 pounds. Nevertheless, due to the extreme limitations of weight put on these experimental engines by the navy, this crankcase was considered to be too heavy and was scrapped.

Construction of a second engine was then undertaken, and alloy steels were employed to effect a further weight reduction of 400 pounds. This was the first use of alloy steel and welds in the main load-transmitting members of a two cycle diesel engine. This engine was ordered on April 28, 1933 and shipped on May 17, 1933. After a long experimental run of approximately 8,000 hours it was finally destroyed by over-speeding. The crankcase, however, was not damaged.

Concurrent with this development, the railroads were becoming interested in light weight, high speed diesel-operated trains. A 12-cylinder vee-type Winton engine, burning distillate, powered the original Union Pacific three-car, high speed train built by Pullman. The crankcase for this engine was ordered on June 23, 1933, shipped September 12, 1933 and followed the same type of construction as has been described, namely, the use of full strength welds and flame-cut load members. Meanwhile, the full line of Winton two cycle unit injection engines in eight, twelve and sixteen cylinders were about ready to be built for railroad and navy work. A two-cycle, full diesel, straight eight engine powered the original Burlington three car Zephyr. This crankcase was ordered on November 2, 1933 and shipped November 18, 1933. This engine has been in continuous service for over two years and the welded structure has been eminently satisfactory. Photograph 513 C shows the crankcases ordered November 14, 1933, and shipped on December 27, 1933 on the original Winton navy submarine contract for 18 engines. Through refinement in design, use of the Winton unit injection system, the two cycle principle, and welded steel structures, these engines have been built to a weight ratio of around 17 pounds per horsepower. Rigidity has not been sacrificed; in fact, tests on bearing deflections in the steel crankcases, together with their behavior during the machining operation, have shown these cases to be far more rigid than any type of crankcase used heretofore. This point is of great importance to the user of engines, because rigidity determines main bearing life and limits the wear of all moving parts that are contained within the structure. Maintaining rigidity and cutting weight are directly contradictory, since the modulus of elasticity or the rigidity factor of steel or any other material is a fixed quantity. To accomplish both low weight and high rigidity, the sections must be carefully distributed. Enough steel to do the job must be placed in exactly the most advantageous manner.


Welded steel assembly of latest type crank case frames and cylinder blocks for Winton diesel engines. This type eliminates the expensive flame cut tension load members.

The latest development is the first step in elimination of the flame-cut load-carrying tension members which from the beginning of their use have been rather expensive, although they have served with eminent satisfaction. Our illustrations show the frame and block assembly of two 500 horsepower Winton marine reversing engines for a private yacht. The water boxes are galvanized in view of the salt water service that these engines will encounter. In place of the heavy flame-cut members these assemblies are made up with alloy steel plates in combination with forged alloy steel feet members. It seems today that this construction is approaching an ideal. An equivalent design, using plates and forgings, has been developed for the vee-type engine and fourteen of these are under construction at the present time in the weldery of Lukenweld, Inc.

The main achievements of welded steel construction in diesel crankcases have been strength, light weight and rigidity. Since the main role of the diesel engine seems to be that of the transportation power unit, savings in weight over the old conception of 200 pounds per horsepower have been imperative. The production of adequate rigidity is best achieved with the use of steel, because steel is the most rigid commercial material at the command of the designer.

Paramount, however, above the inherent advantages of steel that accrue to the designer when he properly uses it is the modern achievement of being able to fuse many pieces of steel together into an integral whole. Modern weld metal can be produced with an ultimate strength of 100,000 pounds per square inch together with the requisite ductility to insure plastic behavior. A properly made welded joint can be predictably made to be stronger than the metal which it joins. It can be made stronger not only with respect to its tensile properties but its dynamic properties are equally superior. Its resistance to fatigue and impact warrant its use with the greatest confidence in what may be considered the most sharply loaded structure of modern engineering—the diesel engine.

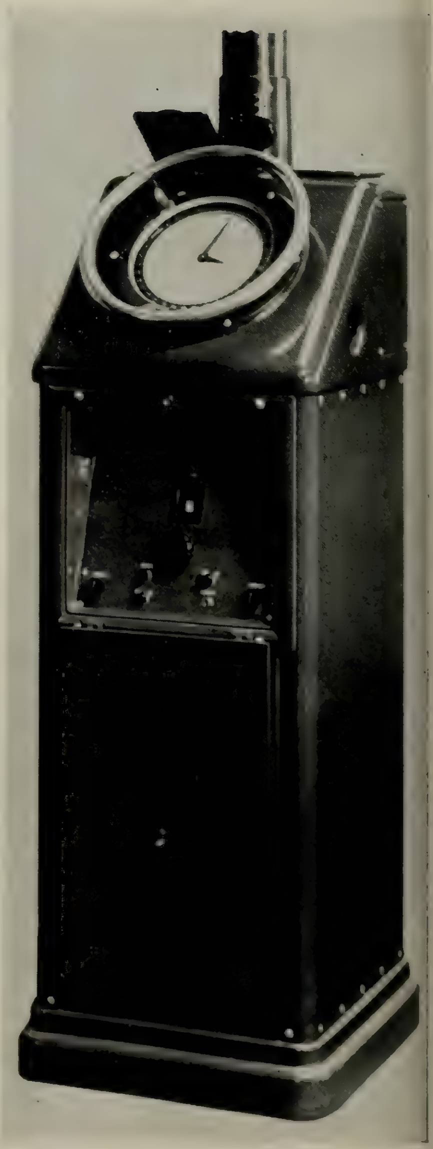
New Type Radio Direction Finder

Another distinct step forward in the development of one of navigation's most important aids, the Radio Direction Finder, has been taken by the Mackay Radio and Telegraph Company. A new Kolster Direction Finder type KRC-105-A was installed several months ago on the bridge of the United States Lines Flagship, S.S. Manhattan and is reported an outstanding advancement by everyone who has had to do with its operation. Included among those who have been particularly unstinting in praise of this new instrument is Commodore Albert B. Randall who commands the Manhattan.

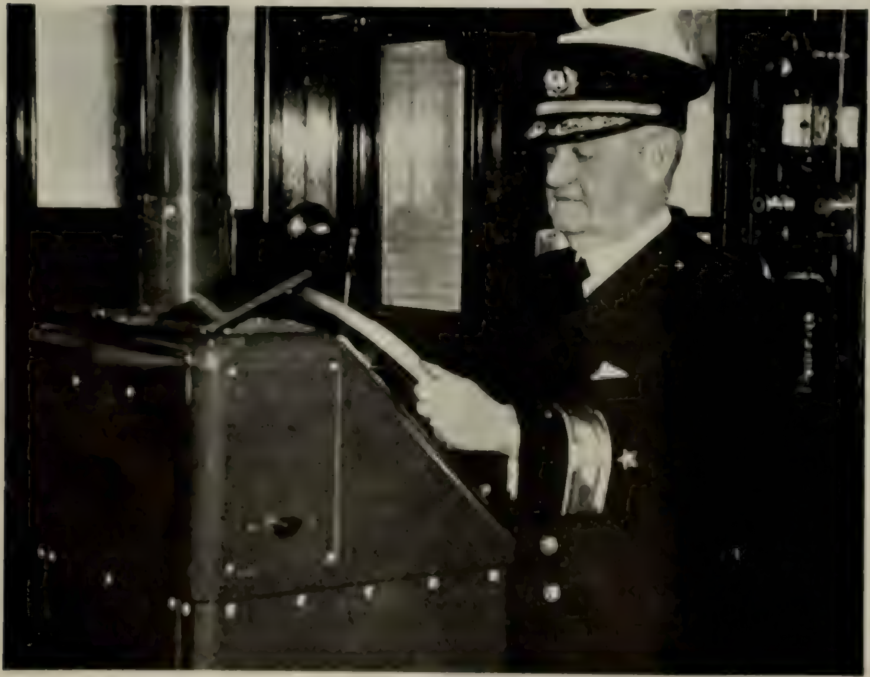
The instrument on the Manhattan is the only one in service at the present time. The second Kolster Radio Direction Finder of the new type will be on the bridge of the "Queen Mary" when the mighty British vessel makes its maiden voyage in May.

Mackay Radio engineers have made their new direction finder more convenient to operate and, of course, this has made a hit with "the Bridge". The wheel which turns the loop is so arranged that it is operated like driving an automobile, at a breast high convenient location.

Of primary importance to the ship's command, however, is the fact that in the several months of trial on the Manhattan, this direction finder established new high standards for sensitivity and accuracy, and the sharpest possible bearings were obtained under all conditions.



New model Kolster radio direction finder as installed on Manhattan.



Another important new feature in the design of the new model Kolster Radio Direction Finder is the arrangement of the bearing indicator scale. The vessel outline engraved upon the face of the indicator in its relation to the pointer gives the navigator at once a clear picture of the relative positions of the bow of his ship and the radio beacon.

A loud speaker unit is incorporated in the upper left section of the binnacle, and this has proved of definite service to the navigator in enabling him to dispense with his earphones when he is relatively close to a beacon station, or for the purpose of steering the vessel by radio bearing.

The Coast Survey on the Pacific Coast

Chapter V. *Coast Survey Personalities*

By Captain Thomas J. Maher

U. S. Coast and Geodetic Survey

Many and varied were the types of vessels used by the Coast Survey along the west coast. Each in turn rendered honorable service and, like men, passed from the scene—a few to be remembered, many to be forgotten. Those which were best known will be mentioned.

The Schooner Ewing, commanded by William P. McArthur, was the first Coast Survey vessel to be employed continuously on hydrographic work along this coast. The paddle wheel Steamer Active, purchased in 1852, saw a wide variety of service, from San Diego to Washington Territory, and gained an enviable reputation, not only as a surveying vessel, but for the part it took in many rescues at sea, and for the service it rendered during the suppression of an Indian uprising in Washington Territory. She was sold on June 12, 1862, as the funds provided were insufficient to keep her in repair. Her place was taken by the Schooner Marcy. The Schooner Humboldt, which arrived in San Francisco from the east coast in August, 1855, became well known. The brig R. F. Fauntleroy, obtained in San Francisco in 1854, and the schooners Yukon and Ernest, were familiar to the waters of Washington Territory.

George Davidson.

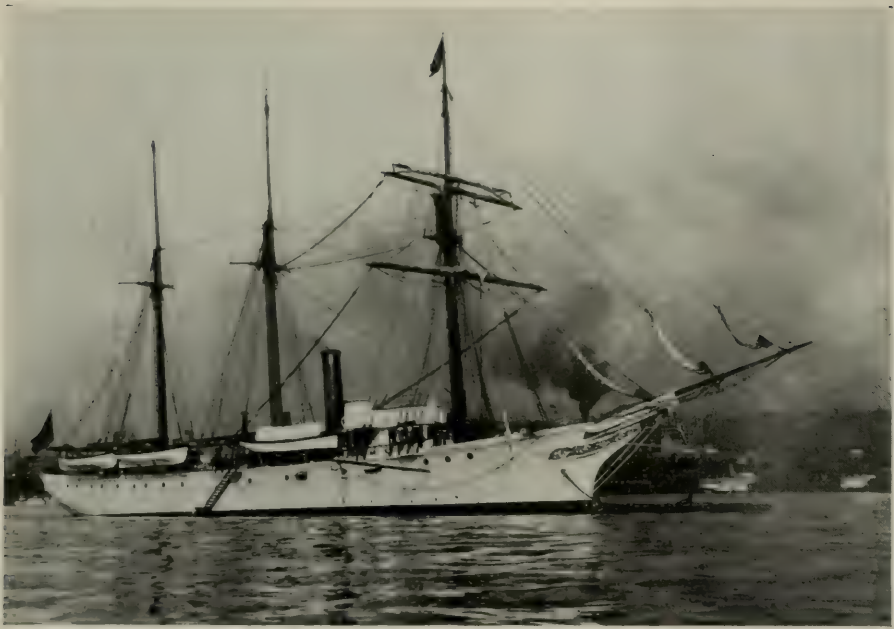
The steamers Gedney, McArthur, and Patterson, the last of the old type of surveying vessels, were good schools for seamanship and for training in the handling of small boats. They turned out good leadsmen, something rare today. Many who have since become masters and mates served apprenticeship in one of these craft.

The McArthur, named after William Pope McArthur, was built at Mare Island in 1876, for use in making surveys of the entrances of the bar harbors along the coast. She was speedily assigned to other duties and for many years saw service in Alaskan waters. She was 115 feet long, 20 feet beam, had a single-cylinder engine and carried 48 tons of coal. On February 8, 1916, having passed her period of usefulness as a surveying vessel, she was sold. During 1918, under the name Violet, she appeared at the Mare Island Navy Yard, having been sent there by the British Naval authorities for repairs and alterations. It is reported that sometime in January, 1920, she was turned over to Guzeman and Nyrup, Salinas Cruz, Mexico, said to be her owners. "Old timers" along the Oakland waterfront now point to a few timbers awash off the western end of Government Island, Oakland Estuary, as all that remains of the U.S.S. McArthur.

Captain William P. McArthur

The Gedney, built in New York at a cost of $63,400, came to the west coast in 1889. She spent her last years as a surveying vessel in Alaskan waters and was sold about the same time as the McArthur. Attempts to use her commercially were not successful and when last seen by the writer, she was tied up in Lake Union, Washington.

The steamer Carlisle P. Patterson was built in New York for service in Alaskan waters. The bid price was $79,400. She was launched on January 15, 1884, reached San Francisco on February 13, 1885, and early in that year started surveying operations in Alaska. She was 163 feet in length, bark rigged, and at that time was the largest of the Coast Survey fleet. The Patterson was noted for the beauty of her underwater line. According to rumors from "old timers", she was intended for sail only and her original design closely paralleled that of one of the famous clipper ships, but after construction was started, the stern frames and timbers aft were modified for steam propulsion. After a notable career in surveying the waters of all sections of Alaska and the Hawaiian Islands, she was sold on December 22, 1921, and since has passed through various hands. At the present time she is used as an Alaskan trader, making annual trips to Bering Sea and beyond Cape Barrow, under the



Survey steamer Carlisle P. Patterson as she was.

capable command of Captain C. T. Pedersen, reported to be one of the best "ice men" on the Arctic. She now has two masts which have been cut down, her draft has been increased, and her original hawse pipes are now under water. She is now diesel driven, her steam engine and boiler having been removed. It is understood that about $170,000 has been spent by different owners in rebuilding and strengthening the vessel.

During the past fifteen years the methods of making marine surveys have changed; so have the types of vessels employed. The Steamers Surveyor, Discoverer and Pioneer, well known to mariners along the west coast, are representative of those now in use.

● Men of the Coast Survey

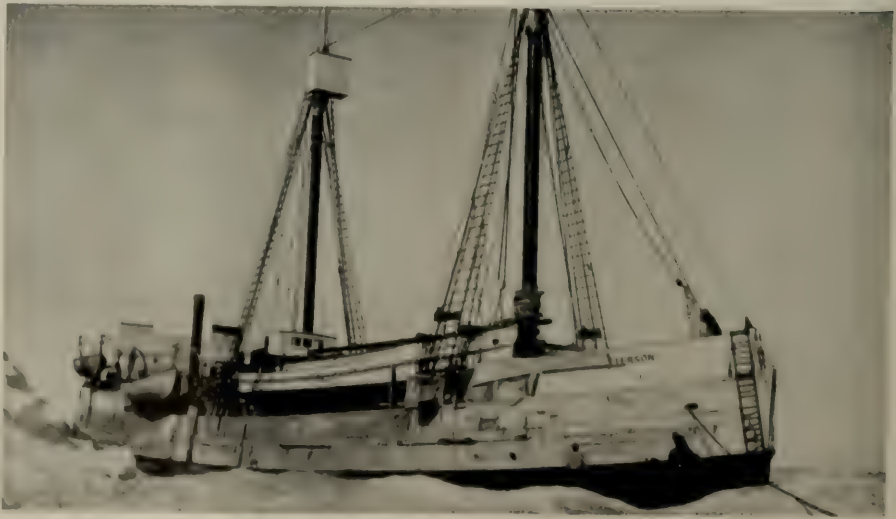
The history of any organization is the history of its men. This statement is particularly true of the Coast Survey on the Pacific coast. Some of those who have directed its operations were of unusual caliber and would be considered so, at any time, in any place.

The first of these men is William Pope McArthur, whose work has been briefly mentioned in this series of articles, and on account of space limitation, cannot be more fully described. His untimely death cut off a brilliant career as oceanographer and explorer.

His grandson, Lewis A. McArthur, now lives in Portland, Oregon, where he is vice president and general manager of the Pacific Light and Power Company. A graduate from the University of California, his classmates and those who knew him there, mention the characteristic which those who come in contact with him, immediately note—his dynamic energy. He is today the most forceful advocate, in public and private life, for good surveys and for the adoption of methods which will correlate all existing land surveys and eliminate the waste and confusion which exist at present. Through the efforts of himself and his associates, great progress has been made along this line in the state of Oregon; I believe I am safe in saying, greater progress than in any of the other western states. He has also been untiring in his efforts to provide better surveys for the mariner. Those engaged in coastwise navigation will agree that the waters of Oregon are well charted. He has written a short history of the life of his grandfather and also a treatise on Oregon Geographic Names, a volume of 450 pages of condensed Oregon history, one of the best works of its kind.

George Davidson is the outstanding figure in the Coast Survey. Only a few brief remarks will be added to those already made. He left the imprint of his genius in whatever he touched. Familiar with and an adept

Lewis A. McArthur.



The motorship Patterson, Alaska trader, shown here in the ice off Point Barrow, bears little resemblance to the fine hull from which she was rebuilt.

n every branch of surveying, he was more than a surveyor. He was a scientist, engineer and geographer. He was one of those who were instrumental in securing the erection of he Lick Observatory. Amongst a few of his writings are The Tracks and Landfalls of Bering and Chirikof, Identification of Drakes Bay, An Examination of the Early Voyages of Exploration on the Northwest Coast of America from 1539 to 1603. The erection of Prayer Book Cross in Golden Gate Park may be attributed in part to his efforts. The following is quoted from Henry R. Wagner's George Davidson, Geographer of the Northwest Coast of America: "Another of his outstanding services, and one now little known, was his discovery in 1857 that the seals on the asserted grant of land to Limantour, which purported to cover part of San Francisco, were forged. He wrote a report on Harbor and River Improvement in China, Egypt, Italy, Holland and Great Britain, based on personal observation. It was ordered printed by the United States Senate. He made an investigation of sewage disposal for the City of San Francisco. He was President of the California Academy of Science and also of the Geographical Society of the Pacific. From 1877 to 1884 he was Regent of the University of California."

On June 30, 1895, he retired from the federal service. He later became Professor of Geography at the University of California. In 1910 the University conferred on him the degree of Doctor of Laws. He died December 2, 1911.

James Alden succeeded William P. McArthur as commanding officer of the Coast Survey Schooner Ewing. He was born at Portland, Maine, March 31, 1810. entered the U. S. Navy April 1, 1828, was made a lieutenant February 25, 1841, commander in 1855, captain in 1863, commodore in 1866, rear admiral in 1871. He retired in 1872 or 1873. He died in San Francisco February 6, 1877. At one time he was Commandant of the Mare Island Navy Yard. He accompanied the Wilkes Exploring Expedition around the world in 1838-1842 and it was during that period, in 1841, he first came to California. He later served in the Mexican War in all the leading seaboard engagements. He returned to California in 1850, having been assigned to duty with the Coast Survey.

Until the outbreak of the Civil War, Commander James Alden was actively engaged in making hydrographic surveys along the west coast, from San Diego to Washington Territory. While on this work he took an active part in making many rescues at sea, some of which will be mentioned. In 1852, while in command of the Steamer Active, he took passengers from the Steamer California, disabled off the coast near San Pedro. He made unsuccessful attempts to relieve the ship Samoset, stranded off Fort Point. In 1853 officers from his party transported through the surf about four hundred passengers who were beached when the Tennessee was wrecked. In 1853 an attempt was made to render assistance to the Clipper Carrier Pigeon, wrecked near Point Ano Nuevo. Passengers from the wrecked Steamer S. S. Lewis were brought to San Francisco.

Captain John Francis Pratt.

In 1853 he took an active part in the settlement of a dispute between natives and whites in Washington Territory, where there had been bloodshed. In 1854 he picked up the Steamer Sea Bird, with about one hundred people aboard, near Point Concepcion. She had drifted two hundred miles, as a result of a breakdown in the engine room.

In 1855 he took an active part in the suppression of an Indian uprising in Washington Territory. In the same year at Crescent City he picked up a body of U. S. Army recruits stranded as a result of the burning of a transport. In 1858 he brought to San Francisco the survivors, about 150 in number, from the Steamer Lucas, stranded on the Farallones.

In addition to his qualifications as surveyor, seaman and naval officer, he was an artist of no mean ability. In the gallery of the California Historical Society are some of his water color sketches, amongst which are one of Mare Island in 1855 and another of Crescent City in 1859.

Captain John Francis Pratt was best known to mariners of the northwest seas and those navigating the waters of Alaska, British Columbia and the State of Washington, on account of his personal knowledge of those waters, at a time when they were very inadequately surveyed. After Professor Davidson, he had, perhaps, a wider range of experience in all classes of surveying and a broader grasp of the general work along the west coast, than any man of his time. He saw considerable service under Professor Davidson.

He was born June 18, 1848, and received his early education in Vermont public schools. He attended Kimball Union Academy and Dartmouth College, graduating from the latter with the degree of Bachelor of Science in 1871.

From 1884 to 1895 he was in charge of parties engaged in triangulation, topography, hydrography and astronomical and magnetic declinations in the eastern and western states and along the Alaskan boundary. In 1896 he was transferred to Washington, where he was assigned to duty as Chief of the Instruments Division of the Coast Survey. Two years later he was given command of the Patterson, engaged on surveys off California and in Alaskan and Hawaiian waters. In 1905, under the auspices of the Carnegie Institution of Washington, he commanded the brigantine Galilee on a cruise of the Pacific, making magnetic observations. In 1908 he had command of the Steamer Pathfinder in the Philippine Islands. He was in charge of the Seattle office of the Coast and Geodetic Survey from 1912 until his retirement on June 30, 1920. He died at Seattle, Washington, December 5, 1929.

Largest All Welded Vessel

By R. I. Ingalls, Jr.* *and* S. C. Leigh**

A milestone in the history of shipbuilding was reached on January 29, 1936, when the oil tanker, M. S. Transoil was launched by the Ingalls Iron Works Company of Birmingham, Alabama at their shipyard in Chickasaw (Mobile), Alabama.

Appropriately christened with champagne and in the presence of many distinguished officials and guests, she moved down the ways to become the largest all-welded vessel afloat. The principal dimensions of this interesting challenge to the older type riveted vessel, are as follows:

Length between perpendiculars	251 ft. 3 in.
Length, overall	258 ft. 0 in.
Breadth, molded	43 ft. 0 in.
Depth, molded	16 ft. 8 in.
Displacement at 13 ft. water line	3421 tons
Deadweight at 13 ft. water line	2675 tons
Gross Tonnage (approx.)	1600 tons
Capacity (approx.)	20,000 bbls.
Speed (approx.)	9 knots

Propulsion is through twin screws driven by two 500 shaft horsepower Superior diesel engines of the solid injection, four-cycle type.

She was designed by George B. Drake, naval architect, of New York City and is owned by the American Tanker Corporation of Delaware. Her hull and equipment are classed A-1 under the American Bureau of Shipping and complying with the rules of the United States Steamboat Inspection Service for the transportation of bulk oil cargoes in coastwise, canal and Great Lakes trade.

The all-welded type of construction is not revolutionary in itself, the Ingalls Iron Works Company having successfully built many all-welded barges, dredges and boats of smaller size. Their decidedly successful experience in this field together with their realization of the advantages of welding over riveting, especially in the construction of an oil tanker, encouraged them, together with the designer and owner, to attempt to bring to successful completion this larger vessel, a feat requiring no little pioneering courage.

Engine room of Transoil showing her two Superior diesel engines.

● General Construction

The vessel is constructed with the Isherwood Bracketless system of longitudinal framing in the parallel midship body and with transverse angle framing in the molded bow and stern. She has raised deck forward and lower deck in fore-peak, and raised deck aft and lower deck in machinery space, and steel flat aft of machinery space. The hull is subdivided by nine oil-tight and water-tight transverse bulkheads and by two oil-tight longitudinal wing bulkheads to provide fore-peak, forward reserve tank, four sets of main cargo tanks, cofferdam, machinery space, cross fuel bunker and after peak. Further subdivision is made with steel oil-tight and water tight bulkheads for pump room on starboard side of machinery space and reserve fuel tank on port side.

Space under the raised deck aft is divided by bulkheads to provide quarters for the crew, a galley, a mess room and other compartments.

She is provided with a partially removable pilot house and collapsible hose derricks, signal masts, and other fittings for use in the New York State Barge Canal where overhead clearance is limited.

The possibility that she might be used for package freight was contemplated and she is provided with large cargo hatches and a specially constructed intermediate hold framing that could easily be planked to provide a 'tween deck. Another unique feature is the large size of cargo tanks provided in the midship section. Two of these tanks are 49 feet long, 28 feet wide, 16 feet deep and are among the longest tanks existing in any tanker.

● Advantages of Welding

Over 120,000 feet of welding, or about 23 miles, were used in the construction. Weight saving due to welding is a distinct advantage for the ship-operator as every ton saved in the weight of the hull enables him to carry an additional ton of freight-paying cargo. This is of especial advantage in canal service where the draft, and therefore the displacement, is limited.

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*Vice President, Ingalls Iron Works Co.

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It will be of interest to mention a few of the savings in weight due to welding. Clips between transverse and longitudinal framing are eliminated, a considerable saving with Isherwood construction. Laps and seam widths of bulkhead and shell plating are reduced, boundary angles for attachment of bulkheads to plating are eliminated, angle stiffeners and frames can be welded with their toes to the plate surface instead of the heels as in riveted work. This last item results in considerable saving for the welded ship. If an angle is attached with its heel to the plating, as in a riveted ship a heavier member must naturally be used to provide a section equivalent to a lighter angle with its toe to the plate surface, as in a welded ship.

Another item, of especial interest to the ship owner, is the reduction of the possibility of leakage in the case of collisions or other accidents that would damage the plating. Instances in which welded ships have had their plating practically bent double, yet experienced no leakage have often occurred. That a riveted boat would have leaked like the proverbial sieve in a similar mishap hardly needs stating. This is a threefold advantage as it means elimination of costly delays for repairs, elimination of possible contamination or leakage of cargo and reduction of repair costs.

Other advantages, of interest to the builder, are simplification of drawing and mold loft work due to elimination of riveting details and simplification of tank testing.

● Shop Fabrication

In the construction of the tanker, the work was arranged so that considerable of the assembling and finish welding could be done previous to shipment to the shipyard. This meant that the welding could be done in the downhand position, which is the cheapest, easiest and most satisfactory position in which to deposit the weld material.

The large transverse side frames, constructed of four flanged plates and a channel, were assembled and completely welded in the shop. In the midship section, the side plating, longitudinal bulkhead plating, bilge plating and deck plating over the wing tanks were assembled in as large units as practical for shipping, with the longitudinals shop welded. Units such as the transverse bulkheads were shipped in as large preassembled units as practical with the angle stiffeners shop welded. Items such as companionways, ladders, masts, and hose derricks, were shipped to the yard completely assembled.

● Deck and Bottom Plating

In the midship section, the seams and butts of the deck plating and the transverse butts of the bottom plating were joggled. Both deck and bottom plates were worked longitudinally except at each transverse bulkhead where a narrow heavy plate was run transversely the full width of the boat. This was considered the most feasible method of carrying the longitudinal strength of the bracketless longitudinals around the bulkhead.

The longitudinal stiffeners are angles with the toes welded directly to the plating except over the bottom longitudinal seams and outer seams of deck plating between deck and flanged side plating, where channels were used with one flange spanning the 1-1/8 inch gap between the edges of the plating.

● Bulkheads

The transverse bulkheads were, for the most part, plated horizontally and were cut for the passage of the longitudinal bulkheads and lower portion of the center girder. Angle stiffeners were arranged vertically with the toes welded to the plating and a wide horizontal shelf was fitted on each bulkhead transversely between the wing bulkheads.

The longitudinal bulkheads were plated fore and aft, two plates in height, with angle longitudinals running full length of each tank except at transverse bulkheads where a narrow heavy plate was inserted running full depth of the boat.

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The bilge plates were rolled plates of about a 3-foot radius and the upper strake of side plating was flanged to butt the deck. Angle longitudinals were run the full length of each tank. The longitudinal seam of the side and upper seam of bilge plating were lapped as were the butts of the lower strake of side plating. The butts of the bilge and upper strake of side plating were vee-butted with inside butt straps.

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wide horizontal plate flanged on both sides to form a walkway the full length of each center cargo tank.

The upper section of the girder consisted of a deep flanged plate running the full length of each tank, welded on top to the deck and attached to the walkway by means of angle stiffeners.

Transverses

The transverses in the center tanks consisted of flanged floor plates, attachment to the center girder and wing bulkheads being afforded by large horizontal and vertical plate brackets. Transverses in the wing tanks were large side frames consisting of four flanged plates with a transverse channel stiffener, the plates being slotted for passage of longitudinals. Tripping brackets were fitted between the longitudinals and transverses in both wing and center tanks.

Molded Bow and Stern

Framing in the bow and stern was on the transverse system using flanged floor plates in conjunction with angle side frames with their toes to the shell plating. These frames were bracketed to the transverse deck beams and welded at the other end to the floor plates. Additional longitudinal strength was provided in bilge keelsons and side stringers constructed of flanged plates notched to fit snugly over the transverses. Other longitudinal members were provided by plate center keelsons, and, in the engine room, by means of plate intercostals fitted between the floors with long angles welded to them to form foundations for the main engines. In the fore and side keelsons of a similar nature were provided. These longitudinal members were bracketed to the bulkheads and the side stringers on either side being brought together in the fore peak by means of a plate breast hook.

Shell Plating

The shell plating in both the bow and stern was lapped, the seams being joggle-lapped, except the keel butts which were butted and inside butt-straps fitted.

No holes were punched in any member of the boat for erection or fairing purposes, this being accomplished by a variety of methods.

Welding Machines and Electrodes

All welding was done with heavily coated electrodes of the Lincoln Electric Co., 3/16 inch rods for all vertical and overhead welds, 1/4 inch rods for downhand welding and some 1/8 inch rods for welding of thin plates.

Current was supplied by Lincoln Electric Company and General Electric Company direct current, reversed polarity, arc-welding machines at from 30-50 volts and 125-300 amperes.

Shrinkage Data

By means of a transit, and bench marks on the ways, a careful check was kept on the tanker for any indication of shrinkage. It was expected that shrinkage would be noticed in four principal ways:

(1) Loss of length;

(2) Lifting of the ends;

(3) Loss of beam;

(4) Possibility of the boat being out of line.

Just previous to launching, shrinkage in the full length of 258 feet was 1-3/8 inches. Of this, 1 inch was in the parallel midship body between bulkheads No. 44 and No. 24.

Shrinkage in the full breadth of 43 feet ran from 1/4 inch to 3/8 inch. The bow was about 1/4 inch too high and the stern about 5/8 inch too high.

Another interesting item was that shortly after welding on the bow had started, it was noticed that the bow was out of line about ½ inch to starboard, due perhaps to unbalanced shrinkage stresses. Welding was concentrated on the port side for about a day and the vessel returned to its proper line.

Another interesting fact occurred in the welding of the bow. After welding of the lower part of the fore shell plating had progressed to some extent, it was noticed that the bow was about ½ inch low, yet, a final check showed the bow to be about ¼ inch high. The probable explanation of this phenomenon is that the welding of the lower section of the bow had tended to pull it down but the welding of the deck and upper part of the shell had more than compensated for it.

Another interesting feature was the welding of the stern tubes. These required heavy continuous welds to the shell, floor, and bulkheads. It was thought that if this welding was applied continuously, the concentration of heat might throw the tubes out of position. It was planned, therefore, to deposit the weld a few feet at a time with a cooling period between increments. Through a misunderstanding one of the night men welded the port tube continuously and a check up the next morning proved that the very condition existed that we had hoped to avoid, namely that the tube was about ½ inch out of position. Rectifying this necessitated considerable labor and extra cost. The starboard tube was welded as planned and no difficulty was experienced.

This incident serves as a concrete example of the necessity of following a systematic welding procedure, carefully planned to reduce distortion and stresses to a minimum and the costly difficulties encountered when such a procedure is neglected.

Conclusion

That the welding procedure as outlined was successful is indicated by the fair lines of the completed ship and the extremely small shrinkage in dimensions, which, from available data, were expected to be considerably greater.

Neglecting the savings in first cost of a welded ship over a riveted boat of the same size, which some experts still claim are problematical, the tremendous savings over the life of the ship due to the approximate 15 per cent reduction in hull weight are worth mentioning.

(1) Due to the saving in hull weight, the welded ship has a correspondingly increased carrying capacity and therefore increased revenue per trip.

(2) Consequently fewer trips are necessary to do the same work which reduces operating and repair costs due to wear and tear.

(3) When the ship is loaded, less fuel per ton of cargo is required for the welded ship as its cargo deadweight has been increased at no increase in displacement.

(4) When the ship is empty, less fuel is required for the welded ship as its displacement is less.

The cumulative effect of these savings over the useful life of the ship would be tremendous. In the future, with the development of special shapes for welding, with greater experience in welded design, and with improved technique in welding, the advantages of the welded ship over the riveted will be even more pronounced.

Build Safety into New Ships

Proposed Minimum Standards for Safe Working Equipment, Gear and Places on New Ships

The following proposed minimum standards or specifications for safe working equipment, gear and places in ships to be constructed in the future, and in such vessels as may be extensively remodeled, have been drafted by a special committee of naval architects, ship builders, marine surveyors, marine superintendents and engineers, representatives of classification societies and the United States Steamboat Inspection Service, and safety engineers under the leadership of the Accident Prevention Bureau of the Pacific Coast Marine Associations. The committee has labored thoughtfully over a period of 22 months and now offers these specifications to those interested, for criticism and improvement.

Formulated from the standpoint of the safety engineer, these specifications represent the minimum standards necessary to control the more serious unsafe physical conditions to which passengers and crew are exposed in the daily life aboard a seagoing vessel. Incidentally the comparative freedom from hazard, from accident and near accident brought about by adherence to these specifications for new construction would undoubtedly produce a better morale in crew and passengers and greatly enhance the safety of the vessel in times of emergencies.

This draft as yet has not been submitted for the approval of any association, society, bureau or company represented on the committee.

Any constructive criticism, suggestive alteration or addition, will have careful consideration and grateful acknowledgment if submitted to Byron O. Pickard, manager, Accident Prevention Bureau, Marine Associations of the Pacific Coast, Room 512, 215 Market street, San Francisco.

● General

1. Rules and regulations as prescribed in "General Rules and Regulations, Ocean and Coastwise, Steamboat Inspection Service," dated March 2, 1931, as well as all supplements thereto shall control.

2. Section 10, Suggested Minimum Safety Standards for Cargo Handling Spaces, Gear and Equipment in New Ship Construction of the Pacific Coast Marine Safety Code is hereby adopted by reference.

3. The regulations regarding airports as set forth in the American Marine Standards, Nos. 1 and 3, compiled by the American Marine Standards' Committee, shall govern, and in addition, hinged hooks shall be provided for holding the ports and covers open.

4. Relative to hull oil tank structure, strict compliance with U. S. S. I. S. rules shall be maintained.

5. For the purpose of ventilating tanks under repair, two man-holes shall be provided, one at each end of the tank.

6. Pump rooms in tankers shall be provided with one natural draft ventilator at the top and another extending to the bottom and in addition an auxiliary exhaust blower system shall be provided, exhausting from below the floor plates and discharging to the open air.

● Deck Fittings and Machinery

100. All deck fittings such as eyebolts, ring bolts, cleats, tank vent pipes, etc., shall be so located as to be out of the usual path of travel. All these fittings shall be kept painted a color that will enhance their visibility at all times.

101. All deck piping, flanges and connections shall be placed so as to be readily accessible for maintenance and also out of the usual path of travel. Pipe guards shall be constructed so as to completely protect the piping against damage from boarding seas, deck loads or any articles being handled in the course of the normal operation of the vessel. These guards shall consist either of solid steel plates with a sufficient number of freeing holes, or steel bars secured not more than one inch apart; said plates and bars shall be secured by means of bolts and nuts in order to facilitate removal in event of repairs of maintenance to the pipes.

102. All deck steam pipes where they lead from a bulkhead, or from under the guard, to a winch, windlass or other deck machinery, shall be adequately insulated with an approved insulating material, guarded to protect such insulation from damage. The insulating-guard shall extend over the flanges and joints of the pipe in order to prevent the ship's personnel or others from coming in contact with same.

103. In the case of cargo winches, the operator's position should be at the edge of the hatch so that the operator shall have an unobstructed view of the draft of cargo which he is handling until it is landed in the hold. (See also Rule 1007, Pacific Coast Marine Safety Code.)

104. All deck machinery shall be fitted with guards completely enclosing all gears. Crossheads, connecting rods and cranks also shall be completely enclosed with a guard fitted with hinged covers where access is necessary.

105. Controls on all deck machinery shall be so located that the operator may have full unobstructed vision of all operations aboard ship controlled by the particular piece of machinery in use.

106. The position of the operating gear of an anchor windlass or mooring capstan, shall be such that the operator will be protected in the event of the anchor chain or mooring line carrying away.

107. Fair leads and roller chocks which are intended to furnish a fair lead to the windlass or capstan, shall be located so that the line leading around the roller shall lead into the niggerhead at such an angle that the tendency of the line under strain will be to roll toward the inside of the

drum, or bottom of vertical capstan.

● Rigging

200. All rigging and cargo gear shall be of such design and capacity that preventers will not be necessary except in the event of handling an unusually heavy lift. (See also, Rule 607, Pacific Coast Marine Safety Code.)

201. Neither welded links, padeyes nor eyebolts shall be used for any standing cargo gear or rigging of masts, kingposts, booms or any fitting intended for the handling or securing of cargo or weights.

202. Drop forgings or parts cut from solid wrought steel billets may be used, as any defects in the material will develop in the course of manufacture so that inspection by blows with a hammer will indicate by the ring of the metal whether further X-ray inspection is necessary.

203. The use of unalloyed cast steel is not recommended for parts subject to shock and fatigue stresses.

204. Cast steel to be used for any of the above fittings shall be at least of the Low Carbon 2 per cent Nickel type suitable for use in warm or cold climates and of the following composition:

Carbon %	Max.	0.20
Manganese %	0.60 to	0.90
Silicon %	Min.	0.15
Phosphorus %	Under	0.05
Sulphur %	Under	0.05
Nickel %	Min.	2.00

Recommended Heat Treatment

1725° Far.—2 hours per inch of thickness; air cool.

1500 to 1550 Far.—1½ hours per inch thickness of metal; air cool.

1100 to 1250 Far.—draw; cool in air or furnace.

Note: 1100 to 1250° Far. draw means reheating to 1100° to 1250° Far. for tempering purposes.

205. With cast steel of somewhat higher carbon than (204), increased elastic properties and strength can be obtained. This cast steel is of the following composition:

Carbon %	Max.	0.30
Manganese %	Max.	1.00
Silicon %	Max.	0.40
Phosphorus %	Under	0.05
Sulphur %	Under	0.05
Nickel %	Min.	2.00

The heat treatment recommended is

Normalize two hours 1650° Far. Draw 1200° Far.

206. For moderate cost with strength and ductility superior to Carbon Steels but where mechanical properties desired do not warrant the use of higher nickel steels or chrome-nickel steels it is recommended that Pearlitic Nickel-Manganese Steels be used having the following compositions:

Carbon %	0.26 to	0.32
Manganese %	1.25 to	1.50
Silicon %	0.25 to	0.45
Phosphorus %	under	0.05
Sulphur %	under	0.05
Nickel %	1.25 to	1.50

The heat treatment recommended is

Normalize two hours 1550° Far. Air Cooled; 1000° to 1200° Far. Drawn.

Castings should be inspected under the X-ray for blowholes, shrinkage, cracks, etc., to be certain they are sound.

207. All cargo gear shall be tested and approved by a recognized Classification Society. In the case of cargo booms the capacity shall be clearly marked on the boom and in the case of other gear the capacity shall be recorded in a certificate, a copy of which shall be a part of the ships' official papers.

● Life Boat Arrangement

300. Life boat handling gear shall consist of approved gravity type davits requiring no manual operation, other than the releasing of the grips and winch brakes, to lower the boats. Wherever the hoisting wire is exposed between the winch and the davit it shall be guarded.

● Handling Gear

400. Wherever heavy stores or equipment are to be handled, davits, eyebolts or mono-rail trolleys shall be provided in order to avoid the necessity of hand-handling heavy lifts.

● Manholes

500. All manholes in a ship's structure shall be not less than 14 inches by 18 inches, and shall be located with due consideration of accessibility. Coaming on weather deck shall be not less than 6 inches high.

501. Manholes in bulkheads or other vertical surfaces shall be located in such position as to preclude the necessity of standing on portable ladders, scaffolding, or boxes, etc. for access. In the case of an elevated tank a substantial platform shall be provided for access to manhole.

502. On manholes installed hor zontally and which have hinge covers, the covers shall be so arrang ed that, without locking devices, the shall be secure from falling or mov ing, in any condition of servic Hinged cover manholes installe horizontally adjacent to bulkheads o other obstructions, shall have hinge installed opposite the obstructio and the open cover shall rest at 18 degrees or a greater arc, from th closed position.

503. Hinged covers, and th coamings, which extend above th level of the deck, shall be coated o both sides with aluminum or othe color-contrasting paint to increas the visibility in semi-darkness. Flus manholes and access scuttles install ed in a horizontal plane shall b equipped with wooden plugs for tem porary closing when the manhole o scuttle is being used for fequent ac cess. Said wooden plugs to be flus and fitted with handles, same as ar used on wooden hatches.

504. Where practicable a guar rail shall be installed around suc openings, the rail or chains to be o a minimum height of 36 inches.

505. Tank manholes shall be lo cated with consideration for th rapid ventilation of the compartment preparatory to or during repairs an cleaning.

● Trunks

600. Access trunks which terminate in a deck coaming, shall be located so as to be easily accessible, and when possible, be protected from boarding seas and weather. The trunks shall be no less than 24 inches by 24 inches in the clear inside.

601. Access trunks through which steam pipes pass, shall be at least 24 inches by 24 inches clear of pipe guards. Such pipes shall be grouped along one face of the trunk, and after insulation is applied, portable steel guards installed over the pipes. The guard is intended as protection from the heated pipes and leaking joints, and to protect pipe and insulation from mechanical damage. It is suggested that all pipe joints be installed at common levels to facilitate repairs to same.

602. Trunk coamings terminating on the weather deck shall be at least 36 inches high. Trunk covers are subject to the same safeguards as manholes and scuttles, and where such

covers, due to interference of other objects, have to be stowed vertically when open, they are to have an interlocking strut that will prevent them falling either way.

603. Trunks shall be equipped with overhead gear or davits to insure the same movement of weights through the trunk.

● Hatch covers

700. Hatch covers shall be of the design recommended by Section 10, Rules 1001 and 1002 of the Pacific Coast Marine Safety Code, or the equivalent thereto.

● Ladders

800. The definition of ladders as set forth on page 4, Section 2, Definitions of Bulletin No. 351, Safety Code for the Instruction, Care and Use of Ladders, issued October, 1923 by the Bureau of Labor Statistics, shall govern in distinguishing a ladder from a stairway.

801. All ladders shall be installed in the most accessible and most protected location.

802. Ladders which are hung on the face of a trunk or bulkhead shall have not less than 5 inch clear spacing between bulkhead and rungs to insure satisfactory foothold.

803. Ladders, in trunks providing access to machinery spaces shall be permanently installed in such manner that their removal is not necessary when moving heavy weights through the trunk during repairs. Such ladders shall be offset at intervals of not more than two deck heights, each section terminating in a platform surrounded by hand rails.

804. Ladders in spaces other than cargo hatches or cargo spaces shall be constructed of 3 inch by 6 inch angle bar runners, the rungs to be of 1½ inches by ½ inch flat bar.

805. When cargo space access is by means of manholes or scuttles the ladder rungs shall be in line with the edge of the opening.

806. Ladders in cargo spaces other than the lowest tier or in the lower hold shall have protecting stanchions to insure a clear space between the cargo and the face of ladder.

807. Cargo space ladders shall be constructed of steel plate shaped as a channel and rungs riveted or welded to the toe of webs, or such ladders shall be constructed as follows: See Rule 1008 of Suggested Minimum Safety Standards for Cargo Handling Spaces, Gear and Equipment in New Ship Construction — Pacific Coast Marine Safety Code—Section No. 10.

808. In all cases the ladders shall be so located that the workmen shall face moving cargo. Ladders shall never land a workman over an opening or in a dangerous place. The landing space shall be clear deck space of sufficient area for a workman to turn or move without danger of falling or being struck by moving objects.

809. Ladders which land on a sloping surface shall have a horizontal landing platform at the base.

810. Ladders giving access to house tops, when not subject to damage by gear, shall have side runners or hand rails extending not less than 36 inches above the deck. When such extensions are impractical a grab rod shall be installed, preferably at right angles to the edge of the deck.

811. Access ladders to chain lockers shall be installed in the most protected location and shall consist of half moon footholds cut in the center line bulkhead plate.

● Stairways

900. Stairways are subject to the same rules as ladders, and shall be located with due consideration for relationship to deck openings, moving cargo or weights, cargo gear, etc.

901. Passenger stairways shall have risers and treads of dimensions to give an angle with the horizontal not greater than 36 degrees.

902. Stairways giving access to crews' quarters shall have an angle of rise from the horizontal not greater than 45 degrees.

903. All stairs and inclined ladders shall have strong hand-rails on each side secured to bulkhead or stanchions, and shall be equipped with treads non-slip in service.

904. Stairs or inclined ladders, the upper end of which attach to a deck coaming, shall be arranged so as to prevent tripping. The waterway may be bridged, the coaming cut down, or the top stair tread made flush with the top edge of the coaming. Under no consideration shall the coaming extend above the approach of the stair. When a coaming exists which cannot be cut, a ramp of suitable angle of rise shall be installed on the deck.

905. Stairs or inclined ladders, subject to damage by the handling or stowage of cargo, such as deck loads, shall have an angle not to exceed 50 degrees from the horizontal and shall consist of the equivalent of 6 inch channel sides and steps of non-slip metal treads. When portable types are necessary, hinged rails or gates shall be installed in the way of the stair removed.

906. Companionways over stairs and/or ladders shall provide sufficient head room to preclude the necessity of sliding tops.

● Railings

1000. Storm rails shall be mounted on bulkheads of passenger passageways.

1001. The rails of railing at ship's side, or on house tops where passengers are permitted, shall not exceed 8 inches center to center dimension.

1002. Hand rails shall be installed completely around machinery which is not of the enclosed type.

1003. When a standing railing is impracticable because of congestion, hand rails shall be installed on enclosing bulkhead or structure.

1004. All side port doors shall be equipped with portable rails or chains across the opening at a height of not less than 36 inches above the deck.

1005. Stanchions of gangplanks shall have a minimum height of 42 inches and have two ropes through each line of stanchions. (See also Pacific Coast Marine Safety Code, Rule No. 415.)

1006. A guard-rail shall be provided on all cross-trees in order to provide hand-hold for man working on cargo gear aloft.

● Awning Jack Rods

1100. Jack rods for side curtains shall be located on the inside of the friez plates.

● Chain Lockers

1200. Chain lockers shall be of such dimensions that the chain shall be self-stowing and have a capacity of 150 per cent of the quantity of chain with which the vessel is to be equipped.

● Illumination

1300. Illumination of ship's compartments shall be in accordance with the Recommended Practice for Electrical Installations on Shipboard (American Institute of Electrical Engineers) or with Rule 1009, Section 10—Minimum Standards for New Ship Construction, approved by the Pacific Coast Marine Safety

Code Committee, or whichever standard provides the greater lighting intensity.

1301. Auxiliary machinery rooms shall have a minimum lighting intensity of 2 foot candles and the fixtures so located as to eliminate, as far as possible, all glare and shadows.

1302. All frequented spaces under floor plates and the bilges shall be illuminated.

1303. All machinery spaces shall be painted with aluminum, white, or other light reflecting color.

1304. All instruments in engine and boiler rooms upon which safe operations depend, such as boiler gauges, water columns, engine telegraphs, etc., shall be provided with an illumination of a minimum intensity of 15 foot candles, measured at the instrument.

1305. Stairways, ladders and companion and passage ways shall have a minimum lighting intensity of 2 foot candles.

● Skylights

1400. Skylights of such size or weight that one man cannot safely handle, or any skylight not safely accessible, shall be equipped with a mechanical operating gear.

1401. Skylight glasses in all cases shall be wire insert glass or equivalent.

● Doors

1500. Stateroom doors not exposed to the weather shall have no door sills.

1501. Door sills to bathrooms or toilets shall have only sufficient height to compensate for differences in floor levels.

1502. Doors or openings to shower bath enclosures shall have sills or curbs as low as is practicable, and when steel sills are used they shall be topped with slotted pipe or half rounds.

1503. All doors opening to weather decks shall be equipped with efficient door checks to prevent slamming in any circumstances.

1504. Doors opening to weather or promenade decks shall have sills as low as is consistent with classification rules, and the deck in the way of the door shall be fitted with a permanent non slip tread for a distance not less than 24 inches wide on each side of the door sill. Deck levels on opposite sides of the door shall be the same.

1505. Side port doors shall have sills as low as possible consistent with classification rules, and when structural limitations will permit, the openings shall be a minimum height of 6 feet 4 inches. Side port doors shall be equipped with devices which will facilitate closing or opening and preclude the necessity of men riding the doors or hanging over-side.

1506. Door ramps, whether for men or cargo movement, shall be of rugged construction, and when possible, permanently installed.

● Water Ways

1600. Water ways in any part of the ship, particularly in the way of passenger promenades, shall be as narrow as possible, and shall have cover plates hinged along their edge to insure their replacement after cleaning or painting. The covers when closed shall be flush with the deck.

● Deck Coverings

1700. Deck coverings in galleys, pantries, bath rooms and shower baths shall be Terrazzo or of tile, the wearing surface of which shall contain carborundum, alundum or scoria, which will make the surface non-slip in service.

1701. Deck gratings in spaces available to passengers shall have slots not more than ½ inch wide, and all other deck gratings except those in refrigerating spaces shall have a space not greater than ¾ inch between battens.

1702. All passageway decks shall be covered with a preparation that will be non-slip in service.

● Scaffolds, Walkways

1800. Navigating bridge fronts shall have an outside walkway not less than 12 inches wide to provide safe access for cleaning windows, spreading canvas dodgers, or painting. A rail consisting of the equivalent of 1 inch pipe shall extend across the entire bridge front to serve as a hand rail for the walkway, and also to support painters' stages and the bridge dodgers.

1801. Trunked cargo hatches shall be fitted with hinged steel covers at the various deck levels where necessary. In the event that such covers are not practicable then the trunk shall be equipped with a cat-walk of such design that moving drafts of cargo will not foul it. Said cat-walk to be installed below the hatch beam sockets in order to furnish safe access for workmen shipping or unshipping hatch beams. Flush handholds shall be installed in conjunction with the cat-walk. (This amends Rule 1008, Suggested Minimum Safety Standards for Cargo Handling Spaces, Gear and Equipment in New Ship Construction, Pacific Coast Marine Safety Code.)

1802. Vessels with over-hanging promenade decks shall be equipped with I-beams or equivalent on underside of overhang, upon which monorail trolleys may be mounted, and from which painters' stages may be suspended.

● Engine and Boiler Room

1900. Passageway of a minimum of eighteen (18) inches shall be provided in the way of all machinery to provide safety in operation and repair.

1901. Refrigerating machinery using a toxic refrigerant shall be installed in a separate compartment capable of being isolated from the rest of the ship and vented outboard. On direct expansion systems, the unit shall be placed adjacent or as close as possible to the refrigerating space serviced.

1902. All ladder or stairway treads shall be non-slip in service. The nosing edge shall be a straight line flanged over on a radius of one-half (½) inch with a depth of not less than one and one-half (1½) inches. No cast iron treads shall be used.

1903. All ladders and stairways shall be provided with a sheet metal shield on the underside.

1904. All hand rails on ladders or stairways shall have a hand clearance of at least two and one-half (2½) inches. All hand rails shall be assembled by means of threaded or welded connections.

1905. Gratings shall be constructed with side members extending at least three (3) inches above the surface of the grating on all open edges.

1906. All gratings and floor plates shall be of such material and construction as to be non-slip in service.

1907. In addition to the shaft alley escape, each separate water-tight machinery compartment shall be provided with an escape trunk or hatch giving access to the weather deck, or a passage leading to weather deck.

1908. All manually operated valves shall be located where easily accessible, or provided with extension tems so that it will not be necessary o remove sections of floor plates or ther obstructions to operate the alves.

1909. All steam pipes including langes shall be completely covered with an approved insulating material.

1910. Safe access to all valves above floor plates or deck shall be directly available through the provision of ladders and platforms.

1911. All valves shall be labeled with a metal marker directly on the valve wheel or in the immediate vicinity.

1912. Permanent closed position locking devices shall be provided on all boiler valves in systems to which other boilers are connected.

1913. Relief valves or relief valve discharges shall be located so as to discharge in a safe direction.

1914. All piping shall be marked either by stencilling or painted with distinguishing colors as provided in A. M. S.—0 No. 10—1926. Distinctive Markings for Piping.

1915. Any compartment which may contain lubricating oil vapor shall be provided with labels warning against the use of open flame in the vicinity.

1916. Access spaces from which cranks, crossheads and valve gear are serviced, shall be equipped with strong hand-rails at least forty-two (42) inches above grating or standing plate. Opening below rails to be filled with No. 10 by one and one-half (1½) inch wire mesh mounted on heavy portable frames.

1917. Steps, gratings or floor plates shall be provided, giving access to all parts of the engine which must be reached for servicing.

1918. Jacking engine shall be of the two-cylinder type with the cranks at such angles as to prevent the engine sticking on center.

1919. Jacking engine bull gear shall be completely enclosed in a wire mesh guard.

1920. Reciprocating parts of auxiliaries driven by open reciprocating engines, shall be guarded by a two-rail railing, the top rail to be forty-two (42) inches above the floor plate or base of the machine. The fly-wheel shall have a wire mesh panel guard.

● Shaft Alley

2000. Shaft alley shall be of such dimensions as to provide a minimum clearance of six feet six inches inside of stiffners or other obstructions above walkway.

2001. Walkways in shaft alley shall be of steel floor plates mounted on angles with flanges turned up.

2002. All line shaft couplings shall be completely enclosed with wire mesh guards which shall cover coupling bolts and nuts.

● Boilers

2100. Access openings shall be provided for furnaces, uptakes, breechings and all other places subject to inspection. Such openings shall be free of lugs and other obstructions.

2101. Boiler man-holes to steam and water spaces shall be so located that when boilers are installed entrance shall be free of obstructions inside and outside.

2102. Gratings or landings shall provide safe access to boiler uptakes and breechings.

2103. Permanent fittings shall be installed to support permanent or portable safe staging for servicing boilers.

2104. The oil burner valves shall be installed a safe distance from the fire box opening to prevent operator being burned by flarebacks.

2105. Boiler water gauges shall be of high pressure plate glass type and shall be located so as to be visible to the operators at all times.

2106. Gratings in way of water columns shall be located to permit of safe access while servicing.

● Steering Engine Rooms

2200. Steering engine-rooms and similar machinery spaces insofar as is possible shall not be used as access space to other sections of the ship.

● Machine Shop Equipment Safeguards

2300. All machine shop tools shall be driven by independent motors and all drive chain mechanisms, gears, exposed shafts and couplings if not enclosed by the housing of the machine shall be guarded in accordance with the American Engineering Standards Committee Requirements. (See Bulletin No. 463—Safety Code for Mechanical Power-Transmission Apparatus.) (See Bulletin No. 436—Safety Code for the Use, Care and Protection of Abrasive Wheels.)

● Elevators

2400. Elevators shall be installed in accordance with the requirements of the Second Revision of the American Standard Safety Code for Elevators, Dumb Waiters and Escalators approved by the American Standards Association, July 19, 1931, with the following exceptions:

Pits, Overtravel and Clearances: (Rule No. 103 (b)—Amended to read):

a. The clearance for elevator cars at bottom of power elevator hoistways where the speed of the elevator does not exceed 150 feet per minute, shall not be less than 1 foot between the underside of the car sling and the bottom of pit, when bumpers are fully compressed.

b. Table No. 1—Item No. 1 (amended to read)—clearance 2½ feet.

Hoistway Doors for Passenger Elevators: (Rule No. 120(j)—Amended to read):

c. All passenger elevator hoistway entrance doors must be so arranged that said doors cannot be opened from the outside of the hoistway except the lowest landing entrance door which may be arranged to be opened from the outside by means of a key, when the elevator car is at that landing.

d. An auxiliary lock device shall be used in connection with the lowest landing door which will prevent the door being opened from the outside by means of a key unless car is at that landing. Exception: Hoistway doors of full-automatic button-control elevators which must comply with this Code.

e. Full-automatic button-control elevators may have the lowest landing entrance door arranged to be opened from the landing side by means of a key.

f. Doors shall be double, opening from the middle toward each side, so connected mechanically, that the motion of one door will control the other one.

g. All cargo freight elevators on shipboard shall be full automatic push-button type with power operated doors and/or gates on platforms, and power operated doors and/or gates provided on all hoistway openings.

h. The top landing door gate shall extend from the landing threshold to a height of at least sixty-six (66) inches when closed, unless lack of head room makes doors or gates of

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. . . . *Old Time*
Pacific Coast Steamships

No. 3—S. S. Orizaba—By R. J. Alexander

With the Aid and Assistance of Many Old Timers

Above: One of those assembled layouts from the famous Faber Gallery, San Francisco, showing the Pacific Coast S.S. Company steamer Orizaba and her officers.

The sidewheel steamer, Orizaba, was for over thirty years one of the favorite vessels on the Pacific coast, and trans-Pacific passenger routes. Built in 1854 at the famous yard of Westervelt and Son, New York, her sturdy hull was of white oak framing, planked and ceiled in yellow pine and cedar.

She had four decks—tween, main, hurricane, and awning; two masts rigged as top sail schooner; and one funnel. Her dimensions, as recorded in the early Annual Lists were:

Length	246 feet
Beam molded	35 feet
Depth	18 feet
Draft average	13 feet
Registered tonnage	1334

Her side paddles were driven by a single cylinder vertical condensing steam engine with 65 inch diameter cylinder, and eleven foot stroke, operating on 20 pounds per square inch steam pressure, and acting through a reciprocating beam. Her two boilers were of the locomotive type, with fire box and cylindrical firetube extension, 30 feet long and 11 feet in diameter. This machinery installation was made by the famous old Morgan Iron Works of New York City.

Thirty-one feet in diameter, each of her paddle wheels had 26 buckets, with 19-inch width and 8 feet 6 inches length of face. The center line of the shaft carrying these huge wheels was 9 inches above the deck, and the wheel housing and the beam were the most prominent features of her profile. While the molded beam of the hull was 35 feet, the outside beam over the guards was 60 feet or more.

Amidships accommodations were fitted for about 100 cabin passengers, and forward—in main and tween decks—for about 200 second or steerage class passengers. In those early days of Pacific Ocean steam navigation, the limit of passenger capacity was apparently fixed by the number of passengers available. Passengers were given a rate based on grub and transportation, and this was scaled up or down according to accommodation. Thus a bed on a lounge in the social hall or on a dining saloon table was worth a little more than a shake-

Below: An older picture of the side paddler as a Pacific Mail trans-Pacific liner.

down on deck in either of those compartments, and that interior deck shake-down was in turn higher in price than a spot on the open deck.

Orizaba arrived at San Francisco from New York early in 1855, and was fitted into the Pacific Mail system up and down the coast from San Francisco to Panama, Puget Sound, or the Orient, as occasion demanded. It is recorded of her early experience that in 1858 she took on one trip 786 passengers from San Francisco to Victoria, and Fraser River points, to participate in the British Columbia gold rush of that year.

During the Civil War, this steamer was laid up at the Benecia yard of the Pacific Mail, and in the spring of 1865 she was sold to the California, Oregon, and Mexico Steamship Company for the stated price of $60,000. Under the charge of Captain De Wolf (not Sea Wolf) she re-entered the Puget Sound run in 1868 at reduced passenger fares, charging $10.00 cabin and $3.00 steerage per passenger from San Francisco to Victoria, then a trip of four days or more.

In 1868, she was sold to Goodall, Nelson and Perkins, later the Pacific Coast Steamship Company. They had her rebuilt at San Francisco in the yard of William H. Brown. Apparently she was somewhat altered in dimensions, as all subsequent registers list her as being 240.4 feet long, 34 feet beam, and 15.4 feet depth. She was sheathed with yellow metal and equipped with new emergency life-saving apparatus including five metallic life boats.

Her engine cylinder was apparently fitted with a heavy liner as the diameter now appears as 60 inches. The old boilers were discarded and two cylindrical firetube boilers installed, 12½ feet diameter and 12 feet length, generating steam at 40 pounds pressure.

From 1868 to 1876, she was employed largely on the run south from San Francisco to southern California, and Mexicon ports. In 1877, she again went on the Puget Sound run, and continued in that trade until about 1886. In 1887 she was broken up for scrap in San Francisco.

Thus the Orizaba gave 33 years of good service to the development of the Pacific coast. She was a remarkably fortunate ship as far as casualties were concerned, having practically no black marks on her long record.

Notable among her officers were Captain Harry C. Johnson, who was on her bridge for many years, and Chief Engineer Henry Lapman who handled her machinery with great skill for fourteen years.

A rare closeup photograph of the walking beam of one of the old Pacific Mail side-wheel paddle steamers.

An Efficient Colored Light

A new kind of lamp developed in the research laboratories of the Westinghouse Lamp Company changes invisible ultraviolet radiations into visible light of all the rainbow colors and from 50 to 120 times more plentiful than by present-day methods. The phenomenon of fluorescence, by which invisible radiations of short wavelength are transformed into visible light, is the secret of this new invention.

"A small globule of metallic mercury is vaporized by electricity until it fills a long, slender tube with a dull glow which is rich in ultraviolet radiations", explains Dr. Roy D. Hall, Westinghouse engineer. "Profuse ultraviolet radiations from this arc strike the inside surface of the tube where a coating of chemical powder transforms them into visible colored light, in a sense producing second-hand light."

Ultraviolet radiations are of such short wavelength that the human eye cannot see them. Hence, they lie outside the spectrum of visible light. But when these invisible ultraviolet rays fall on various minerals and chemicals, they are transformed, or "stretched," into visible light. Its color is governed by the characteristics of the chemical substance.

"Knowing how certain chemicals and minerals react to ultraviolet radiations, we can select the one to produce a desired color and use it as the powdered coating on the inside of the glass tube," explains Dr. Hall.

"This transformation is the reason for the greater efficiency of these lamps as sources of colored light. Tungsten filament lamps produce light containing all colors of the spectrum, but to get any one color, all the remaining colors must be removed by filtering, which means wasting them.

"In a blue bulb, for example, only the blue rays of the tungsten light are seen by the eye.

"These new lamps therefore produce colored light at many times the efficiency of tungsten lamps. When consuming 15 watts of electricity they give more colored light than a 60 watt colored tungsten lamp of similar size."

Research into this new method of light production to date has been confined to the lumiline shape of bulb, the long, slender tube which is sealed at each end by a disc-like base.

Like the present lumiline lamp, it will probably enjoy widest use placed end to end to form a continuous line of light. Producing light entirely by fluorescence, it is not to be confused with the various types of filamentless lamps used in advertising signs and generally classified as "neon."

The Modern Ship and Her Equipment From the Shipowner's Viewpoint

Part I—*Hull and Propulsion Machinery*

(Continued from Page 95, March Issue)

By A. J. Dickie

Two widely different types of ship recently delivered in Europe illustrate the practical benefits of designing the ship and her power plant as a unit.

The first is a British effort—the Doxford "Economy Tramp". A tramp ship is a cargo carrier which picks up cargo wherever it is to be had, and carries that cargo wherever it is to be taken. Practically every vessel in the American merchant marine is on a schedule run, based on an American port. We, therefore, have no interest in building tramps. The only reason we pay any attention to this particular Doxford Economy Tramp is that the manner in which she is designed, and the results obtained form a very striking demonstration of the value of making the complete design of hull and power plant one engineering job.

About 1922, William Doxford and Sons of Sunderland, England, a ship building firm with a fine reputation for building sturdy cargo carriers, built the first of a series of motorships which at that time were rather revolutionary. This vessel, the Yngaren, was the first large sea-going freighter to be equipped with single screw direct connected diesel propulsion. Her hull was of the full shelter deck type—420 feet long, 54 feet beam, 37 feet molded depth to shelter deck. She had a displacement of 12,750 tons and a deadweight capacity of 9,350 tons on a draft of 25 feet, 6 inches. She was powered with a four cylinder Doxford opposed piston diesel of 2600 brake horsepower, driving a single screw at 95 revolutions per minute. She was guaranteed to do 10½ knots fully loaded on 9 tons of fuel a day for the main engine. She had electric auxiliaries which were powered by diesel driven electric generators. This ship was very satisfactory to her owners and was followed by orders for a number of similar ships.

About 1930, when the depression in shipbuilding began to hit the cargo carriers, the executives of William Doxford and Sons authorized an engineering investigation and towing tank experiments with the object of producing a complete Doxford ship that would have the maximum combined efficiency of power plant, hull, and propeller. While this investigation was going on, the marine engineering department re-designed the Doxford engine to reduce its weight by introducing welded steel construction and by going to the somewhat higher speed of 115 revolutions per minute.

The hull designers increased the propulsive efficiency right along the lines we have been describing. They soon found that a smaller ship would now furnish the desired capacity and less horsepower would furnish the required speed. They resolved after much investigation to maintain the length and beam, but to decrease the depth. A special stern was designed to make the best possible run of water to the smaller faster propeller.

The net result is a ship with the same speed and cargo capacity, but needing a power plant of only 1800 brake horsepower and burning only 6 tons of fuel a day. The investigation then proceeded to the auxiliaries and it was discovered that the waste heat from the exhaust from the main engine was ample to generate steam to take care of all auxiliaries. So a waste heat boiler was installed and steam drive auxiliary machinery. A donkey boiler was also installed to take care of cargo winches, windlass, and electric lights when in port.

M.S. Sutherland, first of this new type, was delivered in January, 1935. William Doxford and Sons now have sixteen more under construction or on order.

The second example of what can be done along these lines is a combination passenger and cargo vessel delivered early in 1935 from a German shipyard. Some three years back, the Hamburg-American-North German Lloyd combination asked for tender bids on three steamers for their Hamburg-East Asiatic run. The specifications called for hulls of the same general type as our intercoastal passenger cargo liners, California, Pennsylvania, and Virginia. The steam conditions called for were 720 pounds and 880 degrees Fahrenheit in temperature with 26,000 brake horsepower on two screws and 23 knots trial speed. Two of the ships were to be steam turbo-electric drive and one steam turbo-double reduction gear drive. Blohm and Voss, Hamburg shipbuilders, put in a lower bid on an alternate design with 1320 pounds steam pressure and 900 degrees Fahrenheit, the design of hull taking full advantage of the space and weight saving possibilities in welding assemblies of various parts of the hull and of the attachments of machinery to hull. They were given the contract for one electric drive ship on their alternate plan. This ship, S.S. Potsdam, together with S.S. Sharnhorst, electric drive, built to the original specifications of the owners, were delivered in the early summer of 1935. The S.S. Gneisau, geared turbine drive on 720 pound steam also has been delivered.

These three are undoubtedly the most economical steamships afloat. The fuel rate per brake horsepower hour for all purposes would be 0.55 pounds for S.S. Potsdam and 0.58 pounds for the Sharnhorst, based on oil at 19,000 B.t.u. per pound. The better fuel rate is, however, not the most important advantage gained by

	S.S. Sharnhorst	S.S. Potsdam
Length over all	681.84 feet	633.94 feet
Length, load water line	625.41 feet	620.58 feet
Length between perpendiculars	609.08 feet	597 feet
Beam molded	73.8 feet	73.8 feet
Depth molded, B deck	44.94 feet	45.1 feet
Loaded draft	28.86 feet	28.86 feet
Displacement at that draft	24,250 tons	23,630 tons
Cargo deadweight	11,000 tons	12,030 tons
Shaft horsepower	26,000	26,000
Speed	21 knots	21 knots
Gross measurement	18,184 tons	17,518 tons
Net measurement	10,719 tons	10,109 tons

Table of principal general characteristics of S.S. Sharnhorst and of S.S. Potsdam.

the Potsdam over the Sharnhorst, as is shown by comparison of the principal characteristics of the two hulls.

This indicates a reduction of 630 tons in displacement, an increase of 1030 tons in deadweight carrying capacity, a reduction of 710 tons in net measurement — all of this gained with no sacrifice of passenger accommodation or comfort, and with less cost of construction. The normal tolls of the Suez Canal are $1.60 per net ton. On this basis, if Potsdam and Sharnhorst were transiting the canal loaded to their marks, Potsdam's cargo would cost in tolls $1.35 a deadweight ton, while Sharnhorst's cargo would pay $1.56. This differential alone would make a nice profit.

These two examples are sufficient to show benefits that are possible from intelligent design of the ship and her power plant for overall economy from the shipowner's viewpoint. Many other examples could be cited. Unfortunately, American shipowning and shipbuilding is too closely tied up with Federal politics, and is not altogether free to take advantage of these possibilities. However, even in America, we have some examples of this type of designing. A new tanker design was recently developed along these lines by the shipyard staff of the Federal Shipbuilding and Drydock Company at Kearny, N.J. Two vessels to this design were built by the shipyard on speculation and before launching these ships were bought by the Standard Oil Company of New Jersey. These hulls are on the new Isherwood Arcform lines. They carry 12,500 tons deadweight on 28 foot draft and are guaranteed to maintain a fully loaded sea service speed of 11.75 knots on 3000 brake horsepower.

As we look at the 26,000 horsepower power plant layout on S.S. Potsdam, it is very noticeable that each pair of her pressure feed thruflow boilers occupies almost exactly the same deck space as the main turbo generating sets. That suggests the next step in compacting the steam power plant. The turbine is already mounted on top of the condenser. Why not mount the steam generator on top of the turbine, thereby eliminating steam piping? Plans for new passenger liners for the U.S. Lines have already proposed to install the steam generator in the engine room alongside the turbine. Several steam tankers and freighters recently built have boilers installed on deck or on a platform in the upper part of the engine room space. We understand that more than one American and European manufacturer is experimenting along these lines and any day we may have an announcement of the internal combustion steam unit.

Another phase of modern shipping very much in the American limelight just now is safety and particularly in the matter of fire. The principal items for safety in sea transport are a well-found, seaworthy hull, and a reliable power plant. Since the whole of this paper up to this point has been mainly concerned in getting those two items properly designed and coordinated as a single unit, we may assume a ship reasonably safe from all perils of the sea. For safety against fire hazard it is now possible to get satisfactory fireproof and fire resistant material for the construction of every part of our modern vessel, and if any of you undertake to build a vessel to the new rules of the U.S. Steamboat Inspection Service you will find yourself obliged to build her of fireproof materials, furnish her with metal furniture, and almost provide her passengers and crews with asbestos bedding.

The ships being built in America today and practically all ships built during the past ten years have incorporated very high standards of safety. Morale of officers, crew, and passengers is the most uncertain element in sea safety. Statistical records amply prove not only that travel on ships at sea is comparatively a safe method of travel, but that travel on American flag ships is safer than travel on ships under any other flag. Data compiled by Lloyd's register indicate that annual total tonnage lost at sea, expressed as a percentage of total tonnage operated has shown a marked improvement during the past thirty years. In 1905 to 1909, the United States lost an annual average of 1.26 per cent of her total tonnage, Great Britain 1.07 per cent of hers, and the world figure stood at 1.26 per cent—same as the United States. During 1930 to 1934 the United States lost an average annually of only 0.26 per cent, Great Britain lost 0.35 per cent, and the world lost 0.53 per cent.

There is much we could say about super liners, but we are not particularly interested in that class of floating hotel. The larger the ship, the more advantageous is the type of engineering analysis and cooperative design that we have been describing, particularly if that cooperation is extended to include the interior decorator and the technical staffs of the plumbing, lighting, culinary, and interior communication departments.

As Americans, we can be proud of the fact that we have produced the most popular liners on the North Atlantic today, the Washington and the Manhattan. I am glad we are going to get another in the same class to run alongside these two.

We now have in America the second merchant marine in the world in point of tonnage and the first in point of average size. It greatly needs a definite program of replacement with more modern units. This program should be worked out of a complete engineering investigation to establish the safe economic limitations of advance. Preparatory to such an investigation and necessary as a basis for its economic findings is the establishment of a permanent merchant marine policy and of a permanent non-political agency to administer such a policy. Failing such a policy, no American shipowner can afford to start the type of replacement program he knows to be necessary, to meet foreign flag competition or to preserve economic coastwise and inter-coastal marine transport.

Refrigerating Tuna Boats

By F. W. Powers

Los Angeles Office, York Ice Machinery Corporation

There are many fish canneries, small and large, spotted along the Pacific coast. Those on the central and southerly California coast line specialize in sardines and in the various types of tuna fish. These tuna canneries employ hundreds of people in preparing fish for the nation's board, and constitute one of the most promising young industries to be developed in the West. The most spectacular phase of this business, however, is not in the canneries, but several thousand miles beyond the horizon. Out there at sea, if a school were about the boat, would be found seasoned fishermen, feverishly hoisting tuna fish onto the deck. These fish, weighing up to 80 pounds (they are not so good if heavier than that), are thrown on the deck of the boat to lie until the catch is sufficient for the day, or until the school has disappeared.

Many a fish story has been told by inland sportsmen of how the fisherman's hook was literally snatched away from him. This is not far from the truth along the tuna fishing banks. Once a school of tuna is sighted, one of the crew grabs a hand net and starts dipping into the bait tank, scattering small fish all along the path of the school among the thousands of gulping mouths. During the big feed, racks are let down the side of the boat and the gaff hooks are let fly into the middle of everything, resulting in a real honest to goodness strike. The experienced fisherman swings with the strike, and the leaping fish trying to loosen himself gives the fisherman a good work out by the time the fish is landed 15 feet above the water, onto the blistering deck. The strikes come so fast that after a good catch, fishermen are often so exhausted they are ready to fall in a heap with the fish.

Finally the school is gone—except for the fish on deck—and the catch is over. The bait thrower is an important cog in the wheel since he must conserve the supply of bait, still keeping them coming, without feeding too fast.

● Storing the Fish

The catch will often run as high as 50 tons in a single day's fishing. During the rush of the catch, fish lie on the deck with a 140 degree sun beating down on them. After the rush these fish must be thrown through deck holes down into the ice and freezing compartments of the ship's hold. It is the everlasting belief of the fishermen that fish cannot be good unless packed in ice, even though the refrigerated hold is at a low temperature.

● Northbound to Cannery

We must now (once the boat is full) be on the way back North to the cannery docks, there to discharge the catch onto an endless chain which dumps it on the cannery floor for inspection. Here federal and state inspectors scrutinize all fish deliveries. No cracked or so-called "busted" fish must enter a retort to contaminate the good food.

Standing ready are the knifers, gutters, or dressers—pick your own word. These experts clean the big fish deftly and completely with hand and knife movements so fast that the eye can scarcely follow them. In the same tempo the fish are stacked in wire baskets and run into long cylindrical retorts, and when the retort is filled the doors are securely fastened forming a steam-tight cylinder. Steam is turned in under pressure until the fish are given a thorough cooking. The fish carcasses from the retort are conveyed to the long tables where the meat extractors, mostly women of foreign birth, remove the delicate tuna meat from the bones.

This meat goes nicely packed into the various size cans, while bones, skins, heads, and practically every other fragment of the fish go to the fertilizer mills located back of the cannery. Can crimpers, labelers and other machinery close the cans of tuna meat and mark them ready for the retail trade. So finally there comes to your table that tuna salad or sandwich.

This fishing business is no small affair, as can be judged by the fact that one cannery will can the catch from over 60 tuna boats, each bringing in from 100 to 200 tons or more in about four trips a season.

● Methods of Cooling Tuna

The first large Pacific coast tuna fishing boat to have adequate refrigeration for fish was the Oceana Vance (1918) which carried on deck two 25-ton York refrigerating machines, oil engine drive, and in the hold plenty of pipe for evaporating surface. This old boat put in and out of Long Beach and San Pedro, and could carry and store 450 tons of tuna. The owners made good, being fortunate in having as master Captain John Heston, a practical man and an old timer in the fish game.

The results of refrigeration were appreciated by others, but not much advance in practice was made until about ten years ago. At that time, an enterprising San Diego fisherman named Manual Medina, realized that fish were leaving for Southern parts unknown and that to pursue them would require a longer cruising radius, larger storage capacity and hence larger boats.

With the assistance of the Campbell Machine Company of San Diego, he initiated plans for a bigger and better craft, resulting in the completion of a 125-foot, high-class tuna fishing boat, the Atlantic. She "had everything," but the heart of the hull was the refrigerating machinery, consisting of a York 10-ton system located in the engine room and using bent and welded iron pipe coils for evaporating surface, proportioned so that the least possible space was taken up by the coils.

It is necessary to have plenty of refrigerating surface around the exposed hull because a tremendous flow of heat naturally passes through the wood planking of a hull in contact with 85 degrees to 90 degrees sea water when the temperature inside the hold must be kept well below freezing at all times. On account of the great difference in temperature between the inside and outside of the hull, it was apparent that steps should be taken to keep out at least a portion of this heat. This led to experiments on insulation for the decks and holds, resulting in the recommendation of corkboard for this class of work.

To get back to the Atlantic, Manual Medina's boat, a great commotion was started among the other fishermen when on the first return trip she brought in 168 tons of "sea chicken." Needless to say, in the few years which have since elapsed, nearly every successful fisherman has provided himself and his crew with a larger boat. These small ships are now known as tuna clippers and all have refrigeration.

● Methods

As with most technical problems, improvements are being made from year to year, principally in the matter of capacity of the refrigerating plant. It has become the general rule to have duplicate machinery, as insurance for the valuable cargoes of fresh fish.

It is considered essential in the fishing trade to carry sufficient crushed ice on board to pack the cargo; therefore, before starting on a voyage the boat is run up alongside a wharf at the edge of which is a crusher, kept there by the ice manufacturing plant for this specific use.

The ice blocks, which weigh 300 pounds or more, are hauled from the ice plant and unloaded at the dock. A 125-foot boat carries 300 to 500 blocks, according to the temperament of the boat skipper. The ice blocks pass through the crusher and fall directly into the hold through a chute. Iced up, the boat heads for the south with the refrigerating machinery in full operation, to keep the ice from melting.

After the catch the fish are stacked in—one layer of fish, one layer of ice alternately. In the old days, by the time the boat got back to port, the ice had all melted from the heat of the fish and the heat coming through hull and deck. Nowadays with modern refrigeration and insulation, not only is the ice saved from melting, but all the heat is extracted from the fish.

● Brine System

A system which has been tried out of late and which is still being improved, is the so-called brine system. Sea water is a clear salt brine. It has a freezing point of less than 26 degrees Fahrenheit and makes a very good medium when chilled, to extract the animal heat from the fish. Salt may be added if required, but some boats are using straight sea water, cooled by passing through a shell-and-tube cooler, the brine passing through the tubes and the refrigerant evaporating in the shell around the tubes. In this system a pump circulates the brine from the compartment in which the fish are placed, through the cooler, and the brine is sprayed down over the fish. When the bait tanks and bait wells are emptied, the last fish caught are thrown in these water-tight compartments, the brine being sprayed over them also. Naturally the bait wells and tanks are filled last as the bait must last as long as the fishing.

● Freezing the Fish

Many a proposition has been worked up for ambitious boat owners, in which the fish are to be frozen stiff in brine carried at zero or lower, and held in this state in water tight compartments until landed at cannery dock. This is an expensive arrangement requiring a considerably larger refrigerating system. It has been in actual operation on a number of Japanese boats, the fish being immersed in zero brine until frozen, then removed and stored like cordwood in the hold.

This system has practically been discarded by the Japanese, and their freezing plants have been placed along the coast on land where the fisherman can bring in the cargo and have the fish frozen and transported in that state to the canneries. While the freezing of fish is a practical method, there is now a general preference among canners for a good firm unfrozen fish. It must be considered from a cost standpoint also, as the cost for freezing will be much more than that of simply extracting the heat from the carcass.

Let us assume, for example, that before fish pulled from the water at 85 degrees Fahrenheit (temperature of the water) can be placed under refrigeration, the temperature will rise 10 degrees in a tropical sun. To take out this heat requires a reduction in temperature from 95 degrees to that of the hold, which is at least as cold as 32 degrees. This is a drop of 63 degrees Fahrenheit and for every pound of fish is equal to almost 50 units of heat. If this same process is carried to freezing of the fish, we must extract 100 more heat units, plus the drop in temperature from the freezing point to that of the surrounding cooling medium which in the case of practical freezing reaches zero. This latter is 13 more heat units. Assume then, that all the heat injurious to the fish is that represented by the 50 units, provided that this be extracted quickly, then the balance of heat removed would be in excess of that required to preserve the fish.

Furthermore, frozen fish received at the cannery must be thawed out before cleaning, so there is also the extra expense of additional steam in the retorts required for cooking. From a refrigerating capacity standpoint, the ratio of capacity required for cooling only to complete freezing is as 50 is to 163. In other words, it requires three and one-quarter times the refrigeration to freeze and store, as to cool only. It would appear then that the most satisfactory system is one which will just extract the heat. It is very important that the fish be thoroughly cooled through, as much of the trouble experienced in the delivery of soft fish is the result of not having extracted the heat from the intestinal tract, which starts to spoil if not cooled promptly.

● Insulation

From investigation of a number of boats it has been found that during the voyage, heat coming through the planking causes pockets to melt in the crushed ice, causing soft fish. This has been remedied somewhat in the older uninsulated boats by covering the whole inside surface of the hold with coils or evaporating surface. The capacity needed to do this extra cooling results in larger machinery. The newer boats provide insulation both under deck, around the hull, and in bulkheads. Corkboard is found to be applicable to this work owing to ease of application and from the fact it is in itself waterproof. For a temperature such as is ordinarily carried, four inches of corkboard in two layers is satisfactory with joints broken in each direction and laid first against the skin of the boat so that no dry rot can occur.

Pacific International Trade

Some Notes on Sea-Borne World Trade with Particular Reference to the Pacific Ocean Trade Routes

PACIFIC COAST FOREIGN TRADE
Month of February

Customs Districts	Exports 1936	Exports 1935	Imports 1936	Imports 1935
San Francisco	$ 8,334,325	$ 7,811,616	$ 6,787,072	$ 4,832,221
Los Angeles	5,483,048	5,732,481	4,385,306	3,232,478
San Diego	400,542	348,813	233,497	153,490
Total California	14,217,915	13,892,910	11,405,875	8,218,189
Oregon	1,771,657	2,068,278	492,884	390,448
Washington	4,937,307	4,895,996	2,646,079	1,936,815
Total Pacific Coast	$20,926,879	$20,857,184	$14,544,838	$10,545,452

Two Months Ending February

Customs Districts	Exports 1936	Exports 1935	Imports 1936	Imports 1935
San Francisco	$15,530,547	$15,836,645	$14,028,222	$13,457,951
Los Angeles	13,498,268	15,671,223	10,363,638	6,881,120
San Diego	789,973	685,636	534,470	265,758
Total California	29,818,788	32,193,504	24,926,330	20,604,829
Oregon	3,395,792	3,878,556	1,060,842	853,032
Washington	9,942,647	9,244,702	5,663,360	3,799,071
Total Pacific Coast	$43,157,227	$45,316,762	$31,650,532	$25,256,932

As of April 1, the Department of Commerce reports conditions substantially as follows:

China. Commodity prices for export were on the up, particularly wood oils, cotton seed oil, and sesamum seed which all recorded sharp rises and were in good demand. It is rumored that Chinese and Japanese match manufacturers have made preliminary agreements for cooperative production and distribution in China.

The China National government's four year industrial promotion plan, and similar provincial government plans, are responsible for large imports of industrial machinery. This business in 1935 totalled $20,485,000—an increase of 25 per cent from the year 1934. The machinery imported covered such a broad field of manufacture as cotton mills, cement mills, sugar refineries, hardware manufacture, leather goods, iron and steel products, flour mills, electric power plants, paper mills, alcohol distilleries, ammonia sulphide plants, and many other lines.

It is generally believed that business in machinery will be much better this year than 1935. German firms were the chief suppliers of this machinery to China in 1935, followed by Great Britain and Japan. United States ranked fourth with $2,929,000 worth for the year.

Japan. The lumber market is steady with prices rising. Large arrivals of cotton and wool made the import trade heavy. Uncertainty as to future government policy was curtailing business investment.

Japan's shipbuilding industry is very active in completing the government "scrap and build" or "ship improvement" plan as the Japanese prefer to call it. By the end of 1938, Japan will have 300,000 gross tons of the speediest and most efficient ships afloat, and will have scrapped 500,000 gross tons of her obsolete vessels. This development, together with other industrial expansion, has made Japan one of the world's greatest "scrap steel" markets. She took 29,258 tons from us last year, being exceeded only by Great Britain and Italy.

Japan is chief world source of pyrethrum flowers, used largely as insect poison. Last year's export of this material reached a peak of 16,897,500 pounds. United States is the world's chief market for this product and took 95 per cent of Japan's total export.

Japanese production of rayon yarns reached an all time peak of 224,041,000 pounds in 1935 which was approximately a 50 per cent increase over the 1934 production. Approximately 14 per cent of the 1935 production was exported. Exports of rayon cloth from Japan in 1935 totaled 424,000,000 square yards, a 20 per cent increase over the 1934 total. The present estimated capacity of Japanese rayon yarn factories is approximately 350,000,000 pounds a year.

Philippine Islands. Estimates of a low sugar crop this year (slightly under a million short tons of raw sugar) are welcomed by the sugar interests as giving an opportunity for marketing reserve stocks at a profit. It is estimated that sugar exports to the United States for 1936 will nearly double last year's shipments and almost equal the record of 1934.

The copra market is quiet, and the rice, corn, and copra industries are organizing with the intention of improving conditions in those trades.

The credit situation is good with collections fully 30 per cent better than last year up to April 1.

Netherland India. During 1935, the total export of kapok seed oil from Java and Madura, amounting to 4,373 metric tons, and valued at $413,340 was taken by the United States. These figures represent an increase over 1934 exports of over 140 per cent. Exports to Great Britain, formerly the most important market, ceased entirely in 1935. The oil is employed for industrial purposes, as a substitute for butter and other edible oils. Reduced freights, and the fact that there is no excise tax on this product, makes it a profitable substitute for the oils on which tariffs are assessed.

Straits Settlements. During the year 1935, the Straits Settlements took the place of the United States as chief supplier of raw rubber to Canada. In 1934, United States furnished 86 per cent of the rubber imported to Canada. This figure dropped to 32 per cent in 1935. Straits Settlements, in 1935, furnished 64 per cent. This reversal is due to the removal of the import duty under the preferential tariff British Empire agreements.

● **Miscellaneous Notes.**

French Marks. It is now permissible under the amendments to French import laws that marks of origin required on import packages of preserved fish, preserved vegetables, prunes, and walnuts, may be applied whether in French or in the language of the country of origin. And it is permitted to mark these products with the names of territories or possessions belonging to a country from which they geographically are separated. Preserved fish, for instance, can now be marked "Alaska" if that is the locale of its origin, without the addition of "United States of America."

Sad but True. We note with considerable chagrin that a modern up-to-date broadcasting radio station is being erected in Bagdad and that there will be over 5000 radio receiving sets in Iraq before the end of the year. With this set-up, all of our old friends—the magic rings, lamps, and flying carpets—will be out of a job, and the caliph's wives will know all about his escapades before he consummates them. What is Islam coming to?

Trade Notes

The Buda Company has published a handsome poster giving in readily available form, details, horsepowers, and installation measurements of Buda Silver Crown gasoline and diesel engines.

This poster is free to boat builders, architects and repair shops and is suitable for hanging on shop walls.

A New Duplex Hose. A type of rubber tubing, or hose, of radically new construction has just been placed on the market. It is especially designed for welding equipment and similar services. Twin hose are simultaneously molded with a connecting web between them, so that a cross-section resembles the figure 8. A single length of this non-kinking hose is all that is necessary for equipment which heretofore has required two separate lengths. An additional advantage is that this hose is of Supero construction, with a special cord-wound reinforcement between the first and second braid, giving it a much higher burst limit than ordinary welding tubing. With the ¼-inch size the burst limit is 2,000 pounds. This Supero construction permits the use of differing pressures in each side without torque or writhing.

Supero Siameez is the trade-name adopted for this hose by the manufacturers, Electric Hose & Rubber Co. It is made with individual hose lines in different colors—red and black or red and green, for example, or with both hose lines the same.

Build Safety into New Ships

(Continued from Page 167)

this height impractical, in which case the gates shall be not less than forty-two (42) inches high.

● **Electric Systems**

2500. The A. I. E. E. Standards for Electrical Installations on shipboard are hereby adopted.

● **Miscellaneous Machinery**

2600. All machine shop equipment shall be individually direct driven.

● **Laundry Machine Safeguards**

2700. All power driven laundry machinery shall be guarded in accordance with Bulletin No. 375—Safety Code for Laundry Machinery and Operations, approved by the American Engineering Standards Committee.

2701. All laundry machines shall be driven by independent motors.

● **Galley Equipment (Point of Operation Guards)**

2800. Dough Mixers (Tilting Type) shall be equipped with an automatic power cut-off when bowl is tilted toward unloading position. Substantial stationary cover shall be provided which will close the bowl when in the mixing position.

2801. An auxiliary device in connection with the power control shall be installed so that the blades of the mixer may be moved when the bowl is in tilted position. Such auxiliary control shall provide for the jogging or inching of the machine only when in the open position.

2802. All power driven Meat Choppers shall be equipped with protective type safety chopper head attachment which will prevent the operator's hands coming in contact with feed screw.

2803. All combination Potato Slicers, Vegetable Choppers and Bread and Meat Slicing Machines shall be equipped with effective point of operation guards, and all dangerous moving machine parts, if not enclosed by machine housing shall be guarded in accordance with the above-mentioned standards.

2804. All power galley equipment shall be driven by independent motors.

2805. a. The valve admitting steam to any **Galley Pressure Vessel** should be placed at least two feet to one side of the unit.

b. All steam jacketed Coffee Urns, Potato and Vegetable Cookers, Soup Kettles, etc. shall be independently equipped with safety valves to protect them against excessive steam pressures over that guaranteed by the manufacturers.

c. All main steam supply lines furnishing steam to galley pressure vessel equipment outlined above shall be equipped with a safety valve installed on the low side of the line, immediately adjacent to reducing valve.

d. Relief valves or relief valve discharges shall be located so as to discharge in a safe direction.

e. On all galley pressure vessels an automatic release or steam cut off shall be installed to relieve the pressure before the door is opened while pressure is on the vessel and to prevent turning on the steam until the door is closed and securely fastened.

2806. Oil Burning Galley Ranges: The oil storage tank shall be installed as far away as possible from the range.

Marine Insurance Review

Checking Radio Beacons

U. S. Lighthouse Service Continuously Working to Increase Efficiency of Wireless Aids to Navigation

The only navigational aid which can be observed from great distances is the radiobeacon. This characteristic makes it possible for one or two suitably located monitoring receiving stations to observe all of the radiobeacons in an entire lighthouse district. The increasing reliance of mariners on radiobeacons makes it important that radiobeacons operate exactly as advertised. The quality of the signal tone, clear identification character, accurate adherence to assigned frequency, and accurate timing of transmissions are all important.

The Lighthouse Service has 58 ships and stations regularly observing radiobeacon transmissions. Seven of these are special radiobeacon monitoring stations and the remainder are designated as observing stations. The special monitoring stations are at suitably located sites and make a definite series of scheduled observations daily, whereas observing stations make observations whenever other work and conditions permit.

Special radiobeacon monitoring stations were first introduced in the Lighthouse Service in 1933 in the eleventh district. The two original installations are still in operation and have contributed appreciably to the proper maintenance of radiobeacons in their district. Other districts have since established similar stations. Monitoring off all radiobeacon signals is now a positive requirement, the proper execution of which will make necessary the removal of some observing stations to sites suitable for monitoring station purposes. The equipment of a monitoring station includes a standard Lighthouse Service general-purpose receiver (LSR 108) for receiving radiobeacon signals and high-frequency time signals. There are also provided an accurate clock, usually of the pendulum type, a frequency meter, and in some cases a volume-indicating device attached to the receiver (with auto volume control disconnecting provision) to provide approximate gage of signal strengths of radiobeacons. The typical monitoring station is located at a light station manned by one or two keepers, with telegraph or telephone connections for communication, and without other radio equipment at the station, so that the monitoring keeper can give proper attention to this duty. The keeper makes regular observations on the radiobeacons assigned to him. The observation times are varied but include both night and day periods. Records made include frequency measurement, verification of transmission times, check of proper identification character, transmission speed, and general quality of signal.

The radiobeacon monitoring stations are established primarily for the purpose of making it possible to observe and correct without delay any irregularity in radiobeacon operation. The monitoring stations are also used to detect interference with radiobeacon signals by radio signals outside the Lighthouse Service. The records of the monitoring stations provide a means of evaluating reports relating to radio aids to navigation, particularly when such reports are made by mariners some time after the date of the reported observation. Although monitoring stations are now used only for radiobeacon observations, the rapid increase in number of radiotelephones, and the possible extension of radio in connection with other forms of navigational aids, may make it desirable eventually to use these stations to monitor other Lighthouse Service radio schedules.

The observing stations include 32 ships with radio direction finders, and the remainder are district offices, light stations, depots, and lightships, without direction-finder but with special receiving equipment. These stations observe radiobeacons in their vicinity when other work permits or make special observations when required to determine particular conditions of radiobeacon service or in connection with contemplated improvements or correction of deficiencies in radiobeacons.

Most radiobeacon stations are equipped with alarm devices which ring alarm bells if the radiobeacon signals are not transmitted at the proper times. These alarm devices cannot warn of poor tone or broken signals and they are dependent on operation of the same timing devices which operate the radiobeacon. Therefore, keepers are not permitted to rely entirely on the alarm devices but are expected to regularly listen to their own signals with a suitable radio receiver. Usually the time-signal receiver is equipped with suitable separate antenna and switch to permit supervision of the station radiobeacon signal. At certain important radiobeacon stations a special receiver has been placed in the watch

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room or wheelhouse for this purpose. Keepers' duties at radiobeacon stations are such that they cannot continuously listen to their own radiobeacons, and equipment for measuring frequency and determining signal strength is too expensive to furnish to all stations. For these reasons, and to observe other interfering signals, it is necessary to also observe and monitor at a distance from the radiobeacon stations.

[U. S. Lighthouse Service Bulletin.]

Marine Insurance Notes

Ships Still Disappear. Modern vessels supposedly proof against all ordinary perils of the sea do still disappear and leave no trace on the ever-moving face of the vasty deep. The latest victim of this type of mysterious passing is the Joseph Medill, which vanished from all human contact on her maiden voyage across the Atlantic to be delivered at Toronto, Canada.

Joseph Medill was a motorship, especially designed to carry pulp wood and newsprint in the Great Lakes service. During her construction at the Newcastle-on-Tyne yard of Swan, Hunter and Wigham Richardson, Ltd., she had much publicity as being the largest all-welded hull. Of 259 feet length, 43 feet beam, and 22 feet depth, she had a carrying capacity of 3100 long tons and was designed for service speed of 9½ miles per hour when propelled by twin screws, each driven by a 500 horsepower diesel engine.

Leaving Newcastle, on August 10 last, she was spoken seven days later south of New Foundland, and since that contact, not a trace of her has been found, although special search has been diligently prosecuted by coast guard cutters as well as by an auxiliary yacht chartered by the owners.

Did she strike a submerged iceberg? Was she swamped by some huge sea? Did some mutinous member of the crew open up a sea cock? Thousands of questions arise but there is no answer except that the ship and the 12 souls aboard have vanished.

Shipping Dividends. Always of interest to marine underwriters is the financial condition of shipping. Along this line, there is considerable improvement, although we are a long way below the profit level of those times that shipping operators would consider as "favorable years." Passenger business has shown a great come-back. Cargo business is slightly better.

The United Shipping Company, Ltd., a well-known Danish operating firm, is paying a dividend (5 per cent) on 1935 business, the first since 1930. Swedish Lloyd paid 4 per cent, the first "divvy" for stockholders in 16 years. Several Norwegian companies declared 5 per cent dividends.

New Safety Rules. The United States Bureau of Navigation and Steamboat Inspection has issued new rules governing the installation of safety appliances, emergency safeguards, and fire detection and alarm equipment on existing passenger vessels. These rules are for the most part very good rules from the standpoint of the safety engineer, but they are going to make considerable added overhead for the American ship owner, and be that much more of a handicap to competition with foreign ship operators.

The passenger liner, Columbia, illustrates very well how the application of these rules may work out. Columbia (ex-Belgenland) was purchased by the Panama Pacific Line from the Red Star Line and operated as a cruise vessel, the intention being to transfer registry to the American flag and operate her regularly in trans-Atlantic winter-cruise service. She is of 27,132 tons gross register, was built at Belfast in 1917, and is still considered by Board of Trade experts as eligible for British flag operation as a seaworthy safe ship. Recent investigation shows that the cost of alteration to make her eligible under the new United States rules would be at least one-half million dollars. She is therefore being offered for sale by her owners in the hope that some British owners will buy.

Effects of Lightning. One sometimes hears the uninitiated refer to lightning as the cause of ships disappearing at sea. Lightning might destroy a wooden vessel, but the modern steel ship is practically proof

MARINE INSURANCE DEPARTMENT
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San Francisco Los Angeles Seattle Tacoma Portland Vancouver, B.C.

Another Notable Scrapping

Many of the world's notable steamers have been sold to ship breakers during the past few months. Latest among these is the White Star liner, Homeric (ex-German liner, Columbus) which was purchased March 1 by Messrs. Thomas W. Ward, Ltd., of Sheffield. Homeric was a record ship in two particulars. She was the largest twin-screw ship afloat, and the largest ship driven by reciprocating steam-engines.

Built in 1913 by the F. Schichau yard at Danzig, she was delivered to the British at the close of the war. Her main dimensions were:

Gross tonnage	34,693 tons
L.B.P.	751 feet
Beam	83.3 feet
Molded depth	48.6 feet
Horsepower	30,000
Speed	20 knots

Her engines were four-cylinder, triple expansion jobs, with cylinder diameters of 53 inches, 82.25 inches, and two 96.5 inches, by 71 inches stroke.

This is the seventh ship of the White Star-Cunard fleet to be sold for scrap since the merger of these two companies was effected. The others so sold were the steamers Adriatic, Albertic, Calgaric, Mauretania, Olympic, and Doric.

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from such damage by Jove's thunderbolts. Two recent instances of direct hits show damage practically confined to compasses.

The first of these, a Norwegian tanker, was struck on her foremast by lightning during a heavy thunder storm south of the Lipari Islands. The only apparent effect was that both standard and steering compasses for over 48 hours were 2 to 10 degrees different from normal deviation.

The second instance was a United States lighthouse tender, also struck on the foremast. Her penant was torn to shreds, and her compasses rendered practically useless. The bridge compass was very sluggish with readings in error by 8 points. The pilot house compass needle would swing through only 5 points.

Fireman's Fund Record. Commencing the thirtieth anniversary of the San Francisco disaster on April 18, 1906, the April issue of Fireman's Fund Record (published by Fireman's Fund Insurance Company and its affiliates) is of intense interest to the entire insurance fraternity.

The 32-page magazine carries a handsome cover in two colors depicting the gleaming towers of the present San Francisco rising out of the ashes of its former greatness.

Reviewing the safeguards and precautions that during thirty years have been effected in San Francisco to prevent serious loss of life and

ROY C. WARD GEO. B. DINSMORE WILFRED PAGE
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property in the event of another disaster, the Record marshalls an array of facts never before presented on this interesting subject.

Then follows a brief review of the events of April 18, showing the failure of the water supply and the city's destruction by fire following the earthquake of early morning.

The story closes with a picture of the difficulties encountered by the Fireman's Fund management in honorably settling its 8603 claims, totaling $11,300,000—a sum in excess of the company's total assets at that time.

This settlement, made doubly difficult by the complete destruction of the head office with all its records, the company's fast recovery and subsequent progress, is truly one of the most romantic episodes in the history of insurance.

Fireman's Fund Record—now in its fifty-eighth volume—is the oldest fire insurance house organ in existence.

Freights, Charters, Sales

April 17, 1936.

We have the following fixtures to report:

GRAIN: British Steamer Barrhill, British Columbia to U. K./Cont., Canadian Transport Co.; Greek Steamer Hadiotis, British Columbia to Liverpool, April, Anglo Canadian Shipping Co.; Greek Steamer Rokos Vergottis, San Lorenzo to Los Angeles/Vancouver Range, 13/9, March; British Steamer Ashlea, British Columbia to United Kingdom, 20/-, f.i.o., April/May; British Steamer Dalhanna, British Columbia to United Kingdom, 19/-, f.i.o., April/May; British Steamer Pennington Court, British Columbia to U. K., April.

LUMBER: British Motorship Glenmoor, British Columbia to two ports Shanghai, Dainy, £4600, May/June; British Steamer Lochlomond, British Columbia to Trinidad and Barbados, March; Greek Steamer Marietta, North Pacific to 4 ports Japan or 1 port China, £4800, f.i.o., April; British Steamer King Malcom, British Columbia to Melbourne, £5250, f.i.o., May/June; British Steamer Hartlepool, British Columbia to Sydney, £4600, f.i.o., May/June; British Steamer Hartington, British Columbia to Shanghai, May/June, Ocean Shipping Co.; British Steamer Trelawney, Coos Bay and Columbia River to Shanghai and Nanking, May, Dant & Russell; Norwegian Motorship Ravnaas, British Columbia to Palestine, April, Canadian Transport Co.; American Steamer Exilona, Intercoastal Trade, March, Calmar S. S. Co.; American Steamer Excelsior, Intercoastal Trade, April, Calmar S. S. Co.; American Steamer Commercial Guide, one trip intercoastal trade, April, American Foreign Steamship Corp.; British Steamer Nobata, British Columbia to two ports Japan, £4600, May; British Steamer Stonegate, British Columbia to China, f.i.o., £5200, May; Danish Motorship Asbjorn, Powell River, B. C., to Gulf ports, April, Empire Shipping Co.

TANKER: Norwegian Tank Motorship Varanger, California to Japan, 15/6 March, Mitsubishi Shoji Kaisha.

TIME CHARTER: Norwegian Motorship Tyr, delivery New York, redelivery North of Hatteras or Europe via North Pacific, 4/-, direct continuation; British Motorship Titanian, one trip, Pacific Coast to South Africa, April/May, South African Dispatch Line; Norwegian Motorship Belpariel, 12 months, delivery Tsingtao, redelivery Orient, 4/3, May/June; Danish Motorship "Nordhval, delivery U. S. North of Hatteras, redelivery U.K./Cont. via North Pacific, 3/10½, March/April; British Steamer Mineria, delivery North Atlantic, redelivery North Atlantic or Gulf via British Columbia, 95 cts., April.

SHIPPING SALE: American Steamer Claremont, Hart Wood Lumber Company to Anderson & Middleton Lumber Co.

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BUILDING

Progress of Construction

The following Report Contains all the Data Available Concerning the Shipbuilding Work in Progress at the Leading Shipyards of the United States as of April 1, 1936

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: Order placed for **DD400** and **DD401**, two 1500-ton destroyers for U. S. Navy; no dates set.

FELLOWS AND STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Hull No. 647, Fellows Craft Universal,** L.B.P. 35', beam 11', draft 4'6", sail area, 450 sq. ft., sloop rig; engines twin 30 horsepower, universal flexifour; keel laid November 25, 1935; estimated delivery March, 1936; 95 per cent complete March 15, 1936.

Auxiliary cutter for R. S. Cooper, Burbank, Calif.; L.B.P. 43'3"; beam 12'0"; draft 6'5"; length water line 31'9"; sail area 1061 sq. ft.; motor Kermath Sea Bird; 30 h.p. motor with 2 to 1 reduction gear; propellers 3-blade Hyde feathering; keel laid Feb. 17, 1936; delivery estimated 90 days; designer John J. Alden, Boston, Mass.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

NEW CONSTRUCTION: **2 wooden lighters, 70'x24'x6'** for Alaska Packers Association.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Alitak, S.S. Stanwood, S.S. Castletown, S.S. Kvichak, S.S. Frank H. Buck, U.S.C.G. Golden Gate, S.S. Tahoe, S.S. Coalinga.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Dickenson, S.S. Lurline, S.S. Melville Dollar, S.S. Manukai, S.S. Makua, S.S. Makawao, S.S. Mobile City, S.S. Maui, S.S. President Hayes, S.S. Birmingham City, S.S. Effingham, S.S. Makawao, S.S. Maunawili, S.S. Marion Otis Chandler,** rudder and misc.; **S.S. Manulani, S.S. Mauna Ala, S.S. Mauna Loa, S.S. Monterey, S.S. Steel Worker.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. West Shipper, S.S. Cascade, S.S. Shoyo Maru, Derrick Barge San Pedro, Los Angeles City Fireboat No. 2, Yacht Velero No. 2, Whaler Port Saunders, M.V. South Africa.**

THE MOORE DRYDOCK CO.
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Trinidad, Knute Nelson, Water Barge No. 30, St. Wh. Frances, Margaret Dollar, Diana Dollar, M.S. Patterson, Yuba, Redwood, Mt. Baker, Lake Frances, Golden Hind, Shoshone, American Star, Louise, Madrona, Sutter, Arctic, W. H. Smith, Minnesotan, S. C. T. Todd, Bengalen, Eleanor Christenson, J. C. Fitzsimmons, Glacier, Elizabeth, Glacier, Hawaiian, Wallingford, Georgian, Washington.**

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: **Dom. Govt. Snagboat Essington**—Annual overhaul commenced. **M.B. Katherine B**—Docked, cleaned, painted, annual overhaul. 28 ship repair jobs not requiring docking. 29 commercial jobs.

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); LBP, 334'; beam, 35' 1/8"; loaded draft, 10'10"; geared turbine engines; express type boilers; keel laid August 15, 1934; launched, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); LBP 334'; beam, 35'⅛"; loaded draft, 10'10"; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; launched Dec. 31, 1935.

Two 1500-ton destroyers for U. S. Navy; order placed August 21 1934: **DD392, Patterson,** keel laid July 23, 1935; and **DD393, Jarvis**, keel laid August 21, 1935, estimated completion dates, February 1, 1937 and May 1, 1937, respectively.

Construction of **Destroyer No. 408, U.S.S. Wilson** no date set.

Care and Preservation (out of Commission): **Aroostook, Jason, Kearsarge, Patoka, Pawtucket, Prometheus, Pyro.**

DRYDOCK, PAINT, MISCELLANEOUS: **Pennsylvania, Nevada, New York, Maryland. Swallow, Mahopac, Tatnuck, Challenge, Wando. Aroostook, Jason,** Kearsarge (Crane Ship), **Patoka, Pawtucket, Prometheus, Pyro.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS. **SS. Otsego, S.S. Mexican, S.S. North Sea, S.S. Golden Bear, S. S. Pennsylvanian, SS. Pres. McKinley, S.S. Point Palmas, S.S. Forest King.**

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith,** Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934, launched April, 1936.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery May 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154'; beam 38'; two i.h.p. Atlas engines; keel laid May 25, 1935; launched Jan. 14, 1936; delivery date not given.

Hull No. 114. One purse seine boat;

IN AMERICAN SHIPYARDS

Edited by J. Suitor

82′ L.B.P.; keel laid September 1, 1935. Orders received for 4 purse seine fishing vessels. Complete data next month.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges**; 132′ x 35′ x 10′; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; 19 delivered.

Six standard steel coal barges, 175′ x 26′ x 11′ for Tri-State Transportation Inc.

One derrick boat hull, 90′x30′x5′; for Halliday Sand Company, Cairo, Ill.

6 coal barges; 175x26x11 for Tri-State Transportation Co., Morgantown, W. Va.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: **Hull No. 159, Drayton (DD 366)**, **torpedo boat destroyer. U.S. Navy; keel laid, March** 20, 1934; launched March 26, 1936; estimated delivery May 18, 1936.

Hull No. 160, Lamson (DD 367), **torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launching,** May 20, 1936; estimated delivery, July 13, 1936.

Hulls Nos. 161, 162, and 163; **DD394, DD395 and DD396**; Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively. **DD376**, keel laid, Mar. 26, 1936.

Hulls Nos. 164, 165, and 166, **trawlers**, single screw, steel, diesel propelled, for delivery in July or August, 1936, to Boston, Mass., owners.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA-39, Quincy**, 10,000 tons. Keel laid Nov. 15, 1933; launched June 19, 1935; estimated delivery May, 1936.

Heavy Cruiser CA44, Vincennes, **10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.**

DD361, Clark, keel laid January 2, 1934; launched October 15, 1935; estimated delivery May, 1936.

DD362, Moffett, keel laid, January 2, 1934; launched Dec. 11, 1935; estimated delivery May, 1936.

DD363, Balch, keel laid, May 16, 1934; estimated delivery, June, 1936.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

BETHLEHEM SHIPBUILDING CORPORATION
Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION: Two oil **Tankers**—steam—425′x64′x34′ for Gulf Refining Co.; total tonnage 7070 each.

Ship Surgeons Repair Ship's Broken Back

A major piece of ship surgery was successfully completed recently at the Robins Erie Basin Plant of the Todd Shipyards Corporation, when the British S.S. Welcombe sailed to pick up a cargo of scrap for Japanese ports.

For three weeks, the Welcombe, owned by Pyman Brothers, Ltd., of London, England, lay in the Todd graving dock receiving treatment for a badly fractured back, the result of a collision in the St. John's River, Florida, with the S.S. Cherokee.

The British vessel's starboard side was torn open from the weather deck to the bilge, causing her to sink until the weather deck was just above water. Her upper and lower bridges and the Captain's quarters were also considerably damaged.

She grounded on a bar which ran crossways to the vessel and approximately amidships in way of No. 3 hold. The heavy cargo in her forward and after holds caused the fracture to her back, giving her a hog of approximately 14 inches amidships, the port and starboard plating bulged sharply outward in a vertical direction from the 'tween deck to the bilges, the outer bottom bulged sharply upwards transversely from bilge to bilge and the inner bottom bulged sharply downwards, transversely from bilge to bilge. Her interior was completely flooded including the engine and boiler spaces, up to just under the weather deck.

The vessel was salvaged and raised, the gaping wound in her starboard side being staunched with a fifty ton wad of concrete. Further temporary repairs, consisting of a steel belt placed transversely across the bottom in way of the bulge, were made.

One Canadian and six American repair yards bid for the job, and the Robins Dry Dock & Repair Co. was successful in obtaining the contract. The vessel arrived at the Robins plant on March 14 and was placed in a graving dock. The keel blocks had been previously laid on a level line, and a hogged grade built on top of this to suit the vessel's bottom, with lines attached to the above-grade blocks. A steel plate was laid on the keel blocks under the forward bearing point to allow it to slide forward on straightening.

The temporary repair on the bottom was removed, and the dock flooded until the vessel was just waterborne. The above-grade blocks were then pulled out, leaving a level grade, and while the water in the drydock was slowly pumped out, the vessel was being cut down the port and starboard sides in way of the bulges. The vessel settled easily on the level grade to her original straight keel, the bow sliding forward two and one-half inches. The dock was then pumped dry, the repairs made and the Welcombe started again for Jacksonville, Florida, to load her original cargo for Japan.

CHARLESTON SHIPBUILDING & DRYDOCK CO.
Charleston, S.C.

NEW CONSTRUCTION: **One 60-ft. all-welded lighter** for stock. Rebuilt 6 lighters (wooden) for Chesapeake Corp.

DRYDOCK, PAINT, MISCELLANEOUS: Repairs to Tender **Mangrove,** U.S. L.H. Dept.; **Launch 57; Tug Hinton; Schooner Anna R. Heidritter; Tug Tug Lockwood.**

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One yacht,** L.B.P. 115', beam 17'-6", loaded draft 5'6"; speed loaded 16 miles per hour; keel laid February 15; estimated launching October 15; estimated delivery, June 1936.

165 ft. Diesel-driven, all steel mail boat for U. S. Mail Service on Detroit River.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hull No. 1238, two steel hulls for towboats 169' x 34' 6" x 7' 2" of 1540 gross tons.

Hulls Nos. 1240-1243, incl., 4 covered cargo barges 132 x 35 x 11 for stock, of 2072 gross tons.

Hulls Nos. 1244-1245—two welded towboat hulls 145' x 32' x 6'4" for Pittsburgh Coal Co., of 600 gross tons.

Hulls Nos. 1246-1255, inclusive; 10 welded coal barges 175' x 26' x 10'8" for stock of 4720 gross tons.

Hull No. 1256, welded steel towboat hull, 90'x22'x5' for M & O Dredging Co.; Pittsburgh, Pa.; 135 gross tons.

Hulls Nos. 1257-1261, inclusive; five welded W-2 coal barges; 175'x26'x 10'8"; of 2360 gross tons.

Hulls Nos. 1262-1265 inclusive; four welded flush deck cargo box barges, 100'x26'x6'6"; 660 gross tons.

Hull No. 1267, 1 steel coal barge 130'x34'x4'3" for Pennsylvania Railroad Company, 530 gross tons.

Hull No. 1268, 1 steel hull for towboat, 173'x34'6"x7'2" for John W. Hubbard, Pittsburgh, Pa.; 770 gross tons.

Hulls Nos. 1269-1271 incl., 3 welded steel fuel flats, 125' x 26' x 8'; tonnage 780.

This makes a total of 32 hulls under contract, with a total gross tonnage of 13,353.

ELECTRIC BOAT CO.
Groton, Conn.

Hull No. 20, **Tarpon (SS175)**: L.B.P. 298'; beam, 25'; standard displacement, 1315 tons; keel laid, Dec. 22, 1933; launched September 4, 1935; possible delivery, Mar. 12, 1936.

Hull No. 23, **Perch,** S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; estimated launching, May, 1936.

Hull No. 24, **Pickerel, S.S. 177** keel laid March 25, 1935; estimated launching, June, 1936.

Hull No. 25, **Permit, S.S. 178,** keel laid June 6, 1935; estimated launching, August 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser** and **DD369 Reid** for the U. S. Navy, estimated completion dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington;** keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937.

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938.

One 12,800 tons tanker, "T. C. McCobb", for the Standard Oil Company of New Jersey, launched on February 8, 1936; estimated completion April, 1936.

Two 12,800 tons tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; estimated completion dates October 1936 and December 1936, respectively.

MANITOWOC SHIPBUILDING CO.
Manitowoc, Wis.

NEW CONSTRUCTION: **One steel dredge hull** for U.S. Engineers.

MARIETTA MANUFACTURING CO.
Point Pleasant, West Virginia

NEW CONSTRUCTION: **One Steel Hull Anchor Barge, Hull Size 60' x 22' x 4'**—with steel A frame, deckhouse, and machinery. Built under contract with the U. S. Engineers Office at Vicksburg, Miss., completed and delivered.

One steel barge, 140' x 34' x 10', of 6000 barrels capacity, for the Ashland Refining Co., Ashland, Ky., launched, March 14, 1936; delivered, March 15, 1936.

Ten standard steel coal barges, 175' x 26' x 11' for stock.

Three all-welded steel oil barges, 150'x30'x7' for export.

Two steel needle flats; 40'x14'x3'6"; for Engineers' Office, Cincinnati, Ohio.

Four all-welded oil barges; 175'x35' x8'6"; 6,000 barrel capacity each, for Standard Oil Company of New Jersey, for service on Ohio River.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359** aircraft carrier **CV5, Yorktown,** for U. S. Navy; keel laid May 21, 1934; estimated launching, April 4, 1936; original contract for delivery, October 3, 1936.

H360 aircraft carrier, **CV6, Enterprise,** for U.S. Navy.; keel laid July 16, 1934; original contract for delivery February 3, 1937.

H361, light cruiser, CL47, Boise, keel laid Apr. 1, 1935; original contract for delivery, August 22, 1937.

H362, light cruiser CL49, St. Louis; estimated keel laying Sept. 7, 1936; estimated delivery, Jan. 2, 1939.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357); Hull No. 410, McDougal (DD358); Hull No. 411, Winslow (DD359);** of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge,** Feb., 1936; **DD358, McDougal,** Apr., 1936; **DD359, Winslow,** June, 1936; **CL42, Savannah,** Aug., 1936;**CL43, Nashville,** Dec. 1936; and **CL46 Phoenix,** August 1937.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 1063, Nantucket Lightship No. 112,** building for U.S. Dept. of Commerce—Bureau of Lighthouses; L.B.P. 121'-6", beam 31', loaded draft 13', compound engine, 600 i.h.p., 2 watertube boilers, pressure 165 pounds, keel laid July 17, launched March 21, 1936; estimated delivery, May, 1936.

Hull No. 1064—One steel hull towboat building for Donaldson Towing & Lightering Co., Phila., dimensions: 95' L.O.A. 88' L.B.P. x 24' x 14' 9"; one Unaflow vertical marine type engine, two cylinders 25" dia. x 20" stroke, 130 R.P.M. 600 I.H.P. One Scotch type boiler 13' 3" diam. x 11' 6" long, 3 furnaces; 185 lbs. W.P. Construction schedule not completed.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

NEW CONSTRUCTION: **57 ft. all welded steel hull dredge tender** for Atlantic Gulf & Pacific; L.O.A. 57' 7"; beam 14' 0"; depth 7' 0"; power 140 B. H. P. Fairbanks Morse Diesel Engine.

SUN SHIPBUILDING COMPANY
Chester, Pa.

NEW CONSTRUCTION: **Hull No. 151 Meadville,** ferryboat for Erie Railroad Co.; L.B.P. 192'; beam, 45'; loaded draft, 17'9"; speed loaded 12-13 m.p.h.; 1700 i.h.p. Skinner Uniflow engine; 2 watertube boilers; keel laid June 10, 1935; estimated launching, March 7, 1936; delivered March 23, 1936.

Hull No. 152—steel, twin screw, truck automobile and passenger steamer for Virginia Ferry Corporation. Length 260 ft., beam 59 ft., depth 19 ft. 1 in. 2 4-cylinder Skinner Unaflow engines—each 1400 S.H.P. 2 Foster

(Continued on Page 184)

News of the Yards

AIRPLANE CARRIER YORKTOWN LAUNCHED

With the first lady of the land wielding the bottle of champagne, another of the navy's new aircraft carriers was launched and christened Yorktown, on April 4, at the Newport News Shipbuilding and Drydock Company, Newport News, Va.

Designed to carry 100 naval planes, the Yorktown is the result of all the most recent development in the construction of aircraft carriers.

NORTHWEST TO HAVE NEW COMBINATION TANKER-WHEAT CARRIER

Bids have been received by Carl Nordstrom, naval architect of Seattle, for the construction of a combination tanker and wheat carrier for the Inland Navigation Company. The vessel will be 190 feet in length with a 38-foot beam and 6-foot loaded draft. She will be propelled by diesel engines, and will be capable of 11 knots. She will be twin screw of tunnel stern design. When completed, she will operate on the Columbia river.

TODD DRYDOCKS AT SEATTLE ARE BUSY

More than 400 men are now employed at the plant of Todd Drydocks, Inc., Seattle. The opening of the cannery season and other spring activities in Alaska, with favorable movement of coastwise and intercoastal cargo is given credit for this busiest period which the Todd yards have enjoyed for some time.

TWO NEW TANKERS RUMORED FOR OIL COMPANY

Rumor has it that two turbine-driven tankers are being considered for the Union Oil Company of California, the vessels to form the initial move in a construction program for replacement of the Company's existing 11-vessel fleet, as well as to meet rising traffic demands. It was said that the Union Oil Company executives were desirous of building the new vessels in Pacific coast yards if a proper differential can be established. Talk of three other Pacific coast oil companies planning replacement in their aging fleets of tankers is also reported.

ASTORIA YARD BUILDS FLEET OF SAILBOATS

Order for a fleet of 43 sailing fishing boats has been received by the Lindstrom Boat Yards, Astoria, 33 of which are for Libby, McNeil & Libby, and the remainder for the Nakat Packing Company. Each boat will be 29 feet in length with an 8-foot, 10-inch beam, and 2-foot, 10-inch draft, with the center board or false keel drawn up. Plans provide a 28-foot boom with a sprit sail and a 24-foot mast, stepped well forward. Planking will be of Port Orford cedar with ribs of oak. Capacity of each craft will be about 10 tons net. Modeled after the type of fishing boat used on the Columbia river before the advent of power craft, these vessels will be manned by two men, who must be familiar with sailing as well as with fishing. The reason that so large a number of sail boats are used in the Bering Sea, is that the Bureau of Fisheries will not allow power craft lest the noise of the engines disturb the schools of sockeye salmon on their way to the spawning grounds.

TWO MOST MODERN TUNA BOATS BUILDING

The two most modern tuna clippers yet designed—the Belle of Portugal and the Picoroto, each to cost $130,000—are now building in San Diego. Each will have a cruising range of 7500 miles and will make from 11 to 14 knots.

They were designed with cruiser sterns, a departure from the usual square and flat sterns of tuna fishing vessels, and it is believed the new design will increase the speed about 2 knots. Powered by 800-horsepower engines, the Belle and Picoroto will be able to outdistance any present boats by 3 or 4 knots. Two tanks to hold the 10,000 gallons of fuel, will be separated by the shaft alley in the stern, free passage through the alley being provided to reach the rudder mechanism. Each boat will have quarters for 20 men, with separate cabins for master, mate, chief engineer, and radio operator. A safety measure is locating all fuel tanks aft of the engine room bulkheads.

- **General Engineering & Drydock** Co., Oakland, Calif., are constructing two wooden lighters, 70 feet x 24 feet x 6 feet for the Alaska Packers Association.

- **American Bridge Company,** Pittsburgh, Pa.. have received orders for 6 coal barges—175 feet x 26 feet x 11 feet for Tri-State Transportation Company, Morgantown, W. Va.

- **Defoe Boat & Motor Works,** Bay City, Mich., are building a 165-foot, diesel driven, all steel mail boat for the United States mail service on the Detroit river.

- **Pusey & Jones Corp.,** Wilmington, Del., have under way, one steel hull towboat building for Donaldson Towing and Lightering Company, Philadelphia, Pa. She is 88 feet long between perpendiculars, 95 feet over all, 24 feet beam and 14 feet, 9 inches depth. She will be powered by one Uniflow vertical marine type engine with two cylinders 25 inches diameter by 20 inch stroke, 130 revolutions per minute, 600 indicated horsepower. She will be equipped with one Scotch type boiler, and three furnaces.

- **Spedden Shipbuilding Company,** Baltimore, Md., has under construction a 57-foot all welded steel hull dredge tender for the Atlantic, Gulf, and Pacific Company. She will have a beam of 14 feet, 6 inches; a depth of 7 feet, 6 inches, and will be powered by a 140 brake horsepower Fairbanks Morse diesel engine.

Progress of Construction

(Continued from Page 182)

Wheeler Water Tube boilers, cross drum sectional header type 285 pounds pressure. Estimated date of keel laying Oct. 15; launching May 9, delivery May 30, 1936.

Hulls No. 153-154—steam, single screw, steel oil tankers for Gulf Refining Company. Length between perpendiculars 425 ft., beam moulded 64 ft., depth moulded to upper deck 34 ft., loaded draft 27 ft. 6 in. Each vessel: 1 2800 S.H.P. Westinghouse cross compound double reduction geared turbine unit; 2 Foster Wheeler type A 3 drum boilers—400 pounds pressure. Estimated dates for No. 153. Keel laying Nov. 15; launching Apr. 24, 1936; delivery May 20, 1936. Estimated dates for No. 154: Keel laying November 30; launching May 2, 1936; delivery July 6, 1936.

Hulls No. 155-156. Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485′6″x68′0″x37′0″; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; launching Sept. 19, 1936; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511′x65′9″x37′; 9800 tons.

Hull No. 160, 1 oil tanker (steam) 520′x70′x40′ for Atlantic Refining Co.; 11,400 tons.

TREADWELL CONSTRUCTION COMPANY

Midland and Erie, Pa.

2 15-ton whirler derrick boats—85-foot boom for U. S. Engineers, Huntington, W. Va.

1 Derrick boat for U.S. Engineers at Vicksburg, Miss.

10 Coal Barges, 175′x26′x11′, for Pittsburgh Coal Co.

1 steel gold dredge (ladder type) hull 155′x70′x13′ for South American firm.

UNITED DRYDOCKS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION: **DD364, Destroyer Mahan,** keel laid June 12, 1934; launched October 15, 1935; estimated completion, June 1, 1936.

DD365, Destroyer Cummings, L.B.P. 334′; beam 35′; mean draft 10′10″; keel laid June 26, 1934; launched Dec. 11, 1935; estimated delivery Aug. 1, 1936.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; estimated launching April 18, 1936; estimated delivery indefinite.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; estimated launching, June 2, 1936; delivery indefinite.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267′ overall, 66′ extreme breadth, 19′9″ depth; estimated keel laying, April 14, May 5, and May 26, 1936, respectively; estimated launching, November 17, December 8, and December 29, 1936, respectively; estimated delivery, January 26, 1937.

UNITED STATES NAVY YARD

Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case,** L.B.P. 334′; beam 35′; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, September, 1936.

Destroyer DD371, Conyngham, L.B.P. 334′; beam 35′; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, November, 1936.

DD389 Mugford and DD390 Ralph Talbot, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May, 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION: **U.S.S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; launched Feb. 25, 1936; estimated completion date, June 1, 1936.

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; estimated launching Aug. 1936; estimated completion, Jan. 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD

New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B.P. 600′; beam 61′8″; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, August, 1936; estimated delivery November, 1936.

CL 48, **Honolulu,** light cruiser; L.B.P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January, 1937; estimated delivery September, 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers.

PG. 50, **Erie,** gunboat; L.B.P., 308′; beam, 41″; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; launched January 29, 1936; estimated delivery, July 1, 1936.

CG 69 and CG 70, **Alexander Hamilton** and **John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308′; beam 41′; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia,** L.B.P. 600′0″; beam 61′,7¾″; molded depth at side to main deck amidships 42′0¾″; draft corresponding to normal displacement 21′,8½″; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

DD372, **Cassin.** L.B.P., 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships 19′,7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid, October 1, 1934; estimated completion date, March 15, 1936.

DD373, **Shaw,** L.B.P. 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships, 19′7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid October 1, 1934; estimated completion, June 15, 1936.

Coast Guard Cutter No. 65, George W. Campbell; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, July, 1936.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61′9¾″, depth molded at side to main deck amidships 42′0 3/8″, draft corresponding to normal displacement 21′10″; standard displacement 10,000; estimated completion January 1, 1938.

—Photo by Ted Huggins, Standard Oil Company of California

CABLES ACROSS THE GOLDEN GATE

Thirty-three million pounds of wire have been spun across this monumental bridge linking San Francisco and the North-Bay Redwood Empire. Clearly defined in this infra-red photograph is the world's largest span, 4200 feet.

Observations From The Crow's Nest

"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

Leonard C. Hammond, son of the late A. B. Hammond, has been elected president of the Hammond Lumber Company. Other officers elected at the recent meeting were **G. B. McLeod** and **H. W. McLeod** as vice presidents, and **S. L. Rea** as secretary-treasurer.

Frank E. Short has been appointed general agent on the Pacific coast for the American Export Lines, a company operating a fleet of approximately 20 ships featuring "vagabond cruises." In addition to his new duties, Mr. Short will continue as general agent for the Arnold Bernstein Lines.

Notwithstanding that he travels approximately 90,000 miles a year in his line of duty as chief steward of the Panama Pacific liner, California, **Frank B. Ingraham,** spent his recent vacation traveling 9000 more miles by train and motor car. Ingraham's home is in San Francisco, but as his vacation started when his ship reached New York, he made for San Francisco, spent a few days with his family, and returned to his ship.

R. J. Ringwood, freight traffic manager in San Francisco for the Panama Pacific Lines, is in New York, attending a meeting of the intercoastal lines there.

Alvar M. Tondo has been appointed to succeed **John Scotto** as landing agent of the French Line at New York. Mr. Scotto has been transferred to Los Angeles as agent in that territory.

Clay Hutchinson has been appointed northwest passenger agent for the Grace Line with headquarters at Seattle, according to announcement by **Fred L. Doelker** and **R. V. Crowder,** Pacific coast manager and passenger traffic manager respectively.

Hutchinson is well known on the Pacific coast, for the past 17 years having been connected with Grace interests here, until two years ago when he resigned to operate a travel agency. His new territory will include Washington, Oregon, Idaho, Montana, and British Columbia.

Daniel Marx, Jr., publicity director of McCormick Steamship Company and assistant to C. L. Wheeler, executive vice president, has resigned to enter the bond business.

Propeller Club of California

President
JOSEPH J. GEARY

Secretary-Treasurer
STANLEY E. ALLEN

320 Market Street, Room 249,
San Francisco
Headquarters

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- **Luncheon meetings during the month:**

March 31.

Guest speaker was **Judge Elmer E. Robinson**, presiding judge of the Superior Court. The speaker's topic "The Growth of the Constitution" was a real talk on Americanism by a real American. An enthusiastic audience found inspiration and encouragement from Judge Robinson's well-chosen message. We were favored by the presence of many distinguished guests. The program was in charge of the Legislative Committee with chairman Chas. E. Finney outlining a resume of pertinent maritime legislation now pending before the seventy-fourth Congress.

April 14.

Guest speaker: **Rev. Raymond T. Feely, S.J.**, a faculty member of the University of San Francisco, who is recognized universally as a lecturer and authority. His topic "Conflicting Philosophies" proved to be one of the most interesting discourses it has been our good fortune to hear. Reverend Feeley defined the several systems of government now in operation throughout continental Europe, Soviet Russia and here in our own United States. He drew sharp distinctions between Fascism, Communism, the Corporate system which is the present government of Italy, and our own Democratic system under America's constitution. Father Feeley is an excellent speaker and his listeners were well rewarded. President Joseph J. Geary presided and introduced Chairman of the Day **Dr. Ray Vizzard,** who in turn presented our guest speaker.

- **Jinks!**

Word comes from the entertainment committee that plans are well under way for the Annual Spring Banquet.

The theme of the big affair will be "A Night in Spain". You might jot down the date . . . it will be on Saturday evening, May 23. We are back at the Fairmont Hotel again—Terrace Ballroom this time. The committee is asking for early reservation and the secretary is releasing table bookings in the order in which applications are received. Dick Glissman heads up the committee which is anyone's definite assurance of a grand evening and a swell show.

- **Golf Tournament Clicks!**

The spring golf tournament was held at California Golf Club, Baden, on April 21, where a splendid time was enjoyed by all who attended. Chairman Vernon Showell and the golf committee did a beautiful job in arranging all details for a very successful day. All hands voted the golf course a grand one and the players reported their keen enjoyment of the several flights.

In the evening all hands gathered around a festive board and held the official "post mortem" of the events of the day. During the dinner some very novel entertainment was provided with Chairman Dick Glissman and his entertainment committee aides hitting on all eight. The award of trophies to the lucky tournament winners was made by golf chairman Showell. Here are the fortunate ones:

LOW NET		
	Les Moody	**86-23-63**
FIRST FLIGHT		
Low Gross	**Trev. Smith**	**77**
Low Net	**Geo. Schirmer**	**81-9-72**
SECOND FLIGHT		
Winner	**L. Levin**	**88-18-70**
Runner-up	**H. T. Haviside**	**88-17-71**
THIRD FLIGHT		
Winner	**Paul Faulkner**	**97-21-76**
Runner-up	**E. F. Essner**	**97-21-76**
FOURTH FLIGHT		
Winner	**Capt. E. A. Beeler**	**97-27-70**
Runner-up	**A. J. Campbell**	**102-27-75**
GUEST FLIGHT NO. 1		
Winner	**Ira Lillick**	**89-16-73**
Runner-up	**Lloyd Swayne**	**87-13-74**
GUEST FLIGHT NO. 2		
Winner	**E. P. Peterson**	**93-22-71**
Runner-up	**Fred Lally**	**91-19-72**

A brilliant musical spectacle for our 7th Annual Spring Banquet

1936 Lifeboat Races to be Held in Brooklyn

Robert L. Hague, president of the International Lifeboat Racing Association, recently announced that the 1936 International Lifeboat Race will be rowed off the Brooklyn shore on Saturday, September 12, instead of in the Hudson River on Labor Day. This was the unanimous decision of the Board of Directors of the Association at their meeting at the Downtown Club.

The change to the Brooklyn course, which runs two miles from the Narrows and finishes off Bay Bridge, was decided on in the belief that it would be a harder course to row than in the Hudson and might prove to be a better test of skill and strength. The change from Labor Day to the following Saturday was adopted with the idea that more people would be in the city to view the race than on the holiday.

The Hon. James A. Farley, Postmaster General, was unanimously reelected as Honorary Chairman of the Race Committee.

Mr. Hague announced the following elections for the current year:

Director—H. O. Henriksen, Director, Norwegian American Line.

Rules Committee

Capt. Wm. Drechsel, Chairman
(North German Lloyd)
Capt. Wm. H. Lee
(U. S. Lines)
Capt. H. N. McDougall
(Furness, Withy & Co. Ltd.)
Mr. John Sirignano
(Italian Line)
Capt. S. Christensen
(Danish Line)
Capt. Louis Le Friant
(French Line)
Capt. H. A. Cunningham
(Standard Oil Co. of N. J.)
Capt. Marcus Hegmann
(Norwegian American Line)
Capt. C. C. Baldwin
(United Fruit Co.)

Inspection Committee

Mr. E. L. Stewart, Chairman
(Standard Oil Co. of N. J.)
Capt. Karl C. Nielsen
(U. S. Local Inspector)
Mr. Charles S. Durfee
(American Bureau of Shipping)
Mr. A. D. MacCorkindale
(Lloyds Register of Shipping)

Finance Committee

Capt. John W. McGrath, Chairman
Mr. E. P. Rees
Mr. A. Palanca

Committee of Arrangements

Mr. John D. Reilly, Chairman
(President, Todd Shipyards Corp.)
Mr. J. J. Kelleher
Mr. F. B. Dalzell
Capt. John F. Milliken
Mr. Paul Revere Smith
Mr. C. H. M. Jones
Mr. E. P. Rees
Mr. H. J. Esselborn
Mr. M. D. Stauffer

Those attending the meeting were:

Mr. A. Palanca, General Manager, Italian Line
Mr. J. J. Kelleher, Vice President, United Fruit Co.
Mr. H. Smurthwaite, U. S. Director, Furness, Withy & Co. Ltd.
Mr. E. P. Rees, General Manager, Furness, Withy & Co. Ltd.
Mr. H. C. Henriksen, Director, Norwegian American Line
Mr. Fred B. Dalzell, President, Dalzell Towing Line
Capt. M. Hegmann, Marine Supt., Norwegian American Line
Capt. L. Le Friant, Marine Supt., French Line
Mr. P. R. Smith, Manager, Roosevelt S. S. Co.
Capt. H. A. Cunningham, Port Captain, Standard Oil Co. of N. J.
Capt. John McGrath, President, John W. McGrath Corp.
Mr. R. J. Baker, President, American S. S. Owners Assn.
Mr. H. J. Esselborn, Standard Oil Co. of N. J.
Mr. Robert F. Hand, Standard Oil Co. of N. J. (Asst. General Manager)
Mr. M. D. Stauffer, Standard Oil Co. of N. J.
Capt. John F. Milliken, President, United Licensed Officers Assn.
Dr. William H. Bishop.

Allan Cunningham Passes

As we go to press, sad news comes of the passing of our good friend, Allan Cunningham, president of Allan Cunningham Company, Inc., Seattle, Washington. His sudden demise at the age of 54 after an illness of only four days closes one of the most remarkable careers in the history of maritime development on the Pacific coast.

Born in Glasgow, Scotland, in 1882, Allan Cunningham—after serving an engineering apprenticeship during which he attended night classes in the Glasgow and West of Scotland Technical College—came to Seattle in 1903. He worked for two years in various shops and mining camps, and then, in 1905, entered the University of Washington, graduating in 1910. For three years he worked in the mining camps of Alaska, before returning to Seattle in 1913 to establish the Pacific Machine Shop and Manufacturing Company, which later became Allan Cunningham Company, Inc.

In 1914, this plant began the development of improved electrical deck machinery for steamers and motorships. In 1915, he brought out the famous Cunningham whistle.

In both of these lines, the name of Cunningham has made a world-wide reputation for sturdy, dependable efficiency, and Cunningham winches, windlasses, and whistles are to be found in numerous vessels, under many flags, on all seas.

The manufacture of the full line of Cunningham auxiliaries and specialties will be carried on under the supervision of Ralston Cunningham, brother of Allan, and long associated with him in the firm.

Allan Cunningham was a prominent and honored member of many Seattle civic organizations, and of many national technical societies. He is survived by a widow, three sons, three daughters, two brothers, and four sisters.

K. O. Takahashi of N.Y.K., new manager at San Francisco for N.Y.K.

● New N.Y.K. Manager

Experience covering a wider international field than favors most of us is the background of Mr. K. O. Takahashi, new San Francisco general manager of the N.Y.K. Line. From Manchukuo to London, he has held posts that have given him a peculiarly broad outlook, particularly as it affects his organization.

Mr. Takahashi has been in San Francisco since February 21. It is his first experience in this port. He comments favorably on San Francisco and San Francisco conditions. "One of the most surprising things is the freedom of contact, the ease of carrying on business conditions."

For the past six years he has been manager of the New York office of the N.Y.K. Line. Prior to that he had two different "tours of duty" in London, one in Dairen, Manchukuo, and in investigations on business and transportation opportunities, has visited extensively in such widely scattered areas as Havana, Panama, Siberia and Moscow. It was his report on the Trans-Siberian railway from Dairen to Moscow that immediately preceded his second post in London, which in turn led to his transfer to New York City and thence here.

More than half of Mr. Takahashi's life has been spent abroad.

A man with varied interests, in London he also served as representative of the Japan Ship Owners' Association; in New York as chairman of the Japanese Chamber of Commerce, director of the Japan Society, and vice-president of the Guohen (luncheon) Club; in San Francisco he is now a director of the Japan-American Society and shortly takes over chairmanship of the Nippon Club. He is an ardent golfer.

Mr. Takahashi has two children, a son—K. Y. Takahashi, 18—now in New York completing studies preparatory to entering either Amherst or Stanford; and a daughter—Eiko, 16—in this city. Her name, incidentally, means :"England."

Roy V. Crowder, popular passenger traffic manager of the Grace Line for the past five years, has announced his resignation, to be effective June 1. It is reported that Mr. Crowder will go into business for himself although at the present time he has no announcement to make as to the nature of his plans.

Among those attending the annual conference of the Board of Marine Underwriters of San Francisco, Inc., were **Captain and Mrs. F. L. Clarke** of Vancouver, **Capt. Charles Clarkson,** of Seattle, **A. H. Bryant** of Portland, and **P. B. Young** of Wilmington.

Howard S. Welch of the United States Department of Commerce, Washington, D. C. is visiting the leading cities of the Pacific Coast during May. He plans to be in San Francisco about May 19.

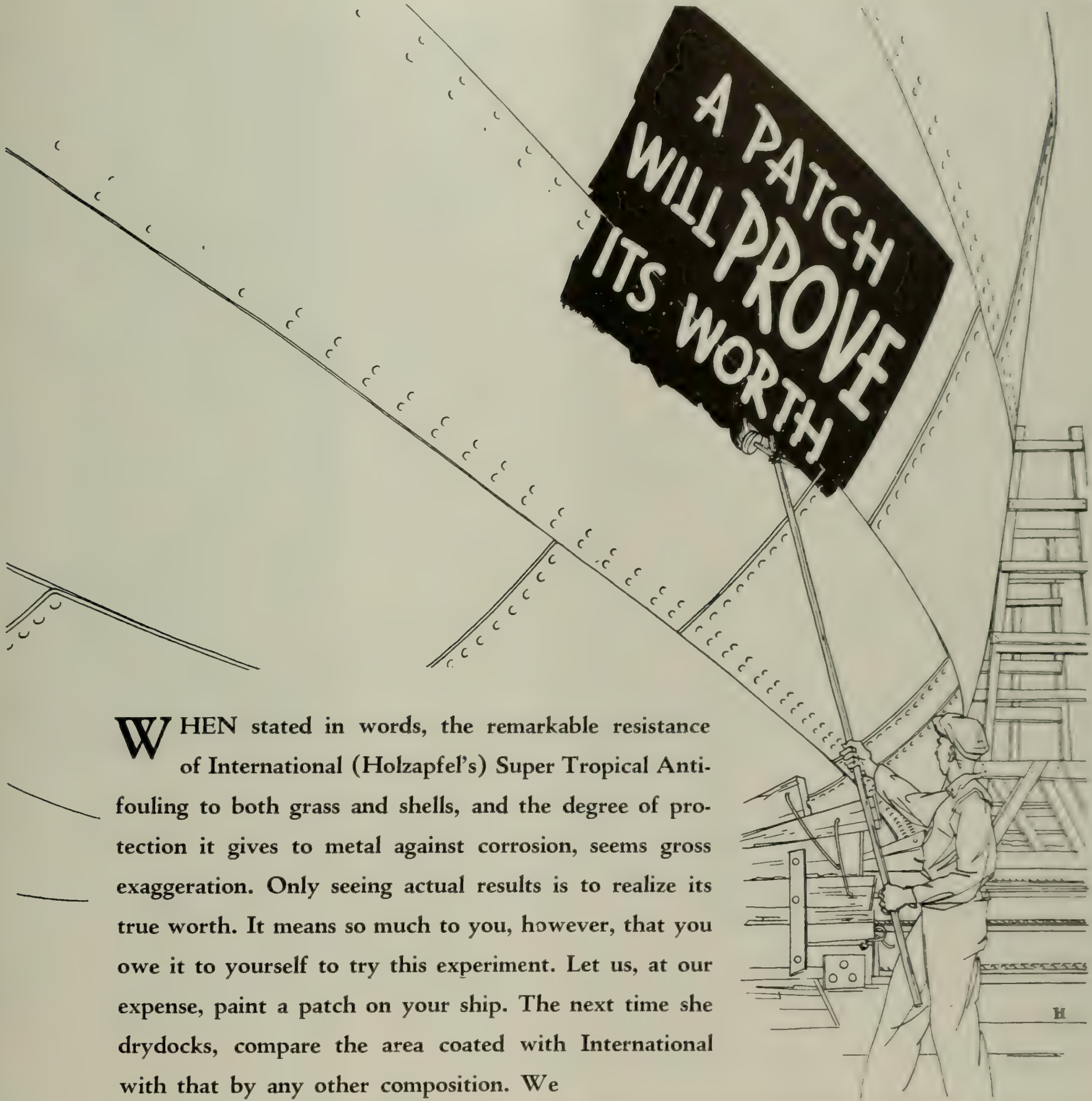
Captain E. G. Heinrici, former port superintendent of the Tacoma Oriental Steamship Company, later active in the service of the Quaker and States Lines, has taken the position of operating manager of Williams, Dimond & Company in San Francisco.

D. De Vries, assistant traffic manager of the Holland-America Line, is now on a business and pleasure trip in Europe.

Walter Brennan, for the past seven years a member of the operating department of the States Steamship Line in Portland has been transferred to the Quaker Line office in Seattle.

G. B. Milnor, formerly with Pacific Continental Grain Company, has assumed the position of Pacific coast manager for Bulk Carriers Corporation, with offices in the Lewis Building, Portland. Bulk Carriers Corporation, whose head offices are in New York City, acts as a bulk cargo carrier in the intercoastal trade, as a steamship owner, broker and agent. The company has two vessels—the steamers, Wisconsin and Oregon.

John E. Cushing, vice president of the American-Hawaiian Steamship Company, is back at his desk after a 3-week trip to New York to attend the general meeting of the Intercoastal Lines.



WHEN stated in words, the remarkable resistance of International (Holzapfel's) Super Tropical Antifouling to both grass and shells, and the degree of protection it gives to metal against corrosion, seems gross exaggeration. Only seeing actual results is to realize its true worth. It means so much to you, however, that you owe it to yourself to try this experiment. Let us, at our expense, paint a patch on your ship. The next time she drydocks, compare the area coated with International with that by any other composition. We rest our case on the results of the test. Write today and arrange for a trial patch.

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Address ....
City.. State..........................
Name of Yard ....

McCormick Announces P.A.B. Appointment

The McCormick Steamship Company, owners and operators of the Pacific-Argentine-Brazil Line which operates from the Pacific Coast to the West Indies and east coast South American ports, announces the appointment of **Pickerell & Company** as agents at Para, Brazil, effective the latter part of April.

Para, located near the mouth of the Amazon river, is the most important shipping point for Brazil nuts, which are largely used in the preparation of candies and other confectioneries. The United States, next to Great Britain, is the largest consumer of these nuts. The Brazil nuts are shipped in bulk, or in cases, when husked.

Pickerell & Company is a general steamship and commission agent in Para, representing several American concerns.

Changes Announced in Officer Personnel of Normandie

The re-entry of the French Line flagship Normandie, world's largest and fastest ship, into the trans-Atlantic service, after a lay-up of seven months, will bring about the following changes:

Captain Hubert Viard, who was second captain on the bridge of the giant French liner since her entry into the North Atlantic run, last year, and who helped supervise her construction for almost two years at the historic shipyards of Penhoet, near Saint-Nazaire, has been named Commander of the steamer Antilles, of the French West Indies and South America service.

Captain Herve Le Huede, who served on the Normandie in the capacity of security officer, has been promoted to second captain, replacing Viard.

The new security officer will be Lieutenant Joseph Cailloce, who, at the time of the launching of the Normandie, was assigned to Saint Nazaire to help supervise details of the construction of the mammoth liner.

Tubbs Rope is Honored

As an acknowledgment of the cooperation extended during the past five years, Tubbs Cordage Company of San Francisco recently received from Six Companies, Inc., builders of the Boulder Dam, a handsome plaque inscribed as follows: "An appreciation of service achievement to Tubbs Cordage Company in recognition of its cooperative contribution to the construction of Boulder Dam—1931 to 1935 — in the supply of Manila Rope—presented by Six Companies Inc."

Accompanying the plaque was a personal letter calling attention to the remarkable service that the 550 miles of manila rope furnished by Tubbs Cordage Company had given during the course of construction of Boulder Dam.

According to **Herman D. Nichols,** vice president of Tubbs Cordage Company, the largest part of this rope was used for what is known as "high scaling" operations — one of the most dangerous feats in construction work of this kind. Many hundreds of feet above the canyon floor, the scalers are suspended in a seat resembling a bosun's chair aboard ship engaged in smoothing the sides of the huge canyon, preparatory to the actual erection of the dam.

During the entire five years of this amazing engineering feat, Tubbs manila rope was used exclusively without a single failure—another indication of its ability to withstand the hardest kind of conditions.

JOHN H. ROSSETER IS MOURNED

It is with profound sorrow that we record the passing of **J. H. Rosseter,** for many years an important figure in the development of the American merchant marine. Mr. Rosseter, who was 67 at the time of his death, started as an office boy with the Grace Line in 1882. He later became president of the Pacific Mail Steamship Company, and subsequently of the Sperry Flour Company. Under President Wilson, he was director of operations for the United States Shipping Board. Mrs. Alice Rosseter, the widow, survives.

The experience this year of Cunard White Star and all other principal lines clearly indicates that there is one principal slogan "Book Early." Easterners have long since realized this and have made their bookings at an early date but generally speaking we Westerners do not take this forethought. Therefore, Western passengers frequently are unable to get any accommodation let alone the desired space.

A point of particular interest to Californians is the special sailing of Franconia from Los Angeles to Europe on May 14th, starting at $271.50 upward. There is a limited amount of space on the Franconia, now completing her round-world cruise, by reason of debarkations at Los Angeles, and that space is available for passengers from Los Angeles to Europe.

Passengers booking from northern California are provided free rail fare (except Pullman) to Los Angeles.

Cunard White Star Line has the largest fleet of cabin and tourist class liners, on the Atlantic Ocean, which includes Queen Mary, Aquitania, Berengaria as well as postwar oil burners.

Diesel-electric Tugs Really Pull

FOR downright pulling power, nothing can beat a Diesel-electric tug. At dock test and under heavy tow she can outpull any other ship of equal horsepower. The reason is easy to understand: any other tug must slow down her engines at low speed—and slow engines won't put out full horsepower. The Diesel-electric engines, operating at constant speed, can always deliver full power. Also, the Diesel-electric tug has a low-speed, efficient propeller that converts this horsepower into pulling power.

Safety

On the Diesel-electric tug, the pilot controls the propeller speed directly from the bridge. Maneuvering is faster and more accurate. This, coupled with the quicker speeding up and slowing down of the tow, means reduced damage to equipment and towline.

Reliable Operation

With two Diesels powering the propeller, an electric tug has the reliability of a twin-screw ship. One engine can be out of service, and still the tug will run at 79 per cent of its free-running speed. Thirty-three Diesel-electric tugs are in operation. We have equipped 21 of them. General Electric, Schenectady, N. Y.

008-14H

GENERAL ELECTRIC

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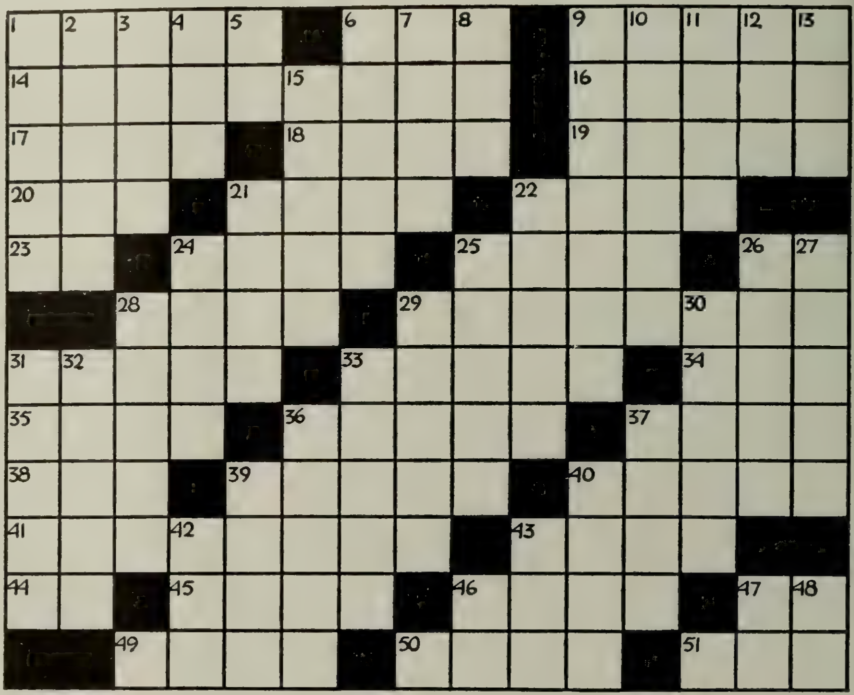
. . . . An Original

Pacific Marine Review Cross-Word Puzzle



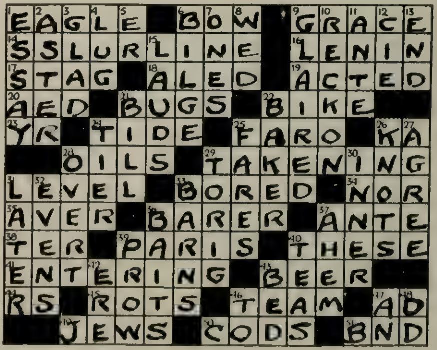
HORIZONTAL:

1. Captain's expression to the crew.
6. Where you'll always find No. 1 Horizontal.
9. East-west — the best ships are built in these!
14. A "Forward-pushing" club.
16. Borders on.
17. These ponies were also — at Tanforan.
18. You'd get this way too—down the shaft alley.
19. To douse in fresh water.
20. The gents who get out the magazine (abbr.).
21. You'll find this in the fire-room.
22. Totals.
23. Electrical Engineer.
24. The sailorman with the whistle.
25. A Scotch hillside.
26. Preposition.
28. To the shelter side.
29. In a rough, peasant-like manner.
31. This means "Goodbye" in Spain.
33. A fissure (we don't mean Paladini!).
34. Intercoastal, it's — the Canal.
35. Deposit on the Delta Bank.
36. Don't let your policy do this!
37. On Prohibition, hulls are always ——.
38. A hold.
39. The old sailor's parrot chirped about pieces of this.
40. Washington was this—in several ways. (But he married a widow!)
41. Beloved.
43. This word is missing in the Lexicon of youth.
44. A handy word for dictators.
45. Alumnus.
46. The man who shot the Albatross got this!
47. What the green light means (shoreside).
49. Don't let him see you working on this.
50. Knife used with a snicker.
51. Your favorite marine magazine (Thank you!).

VERTICAL:

1. Sailors leave their ship and go on this.
2. Ships and shipping thrive on this.
3. Ages.
4. Picturesque head of the old Pacific Mail (initials).
5. Compass point.
6. You'll find this in the steerage.
7. To chop.
8. Do this again if you don't suceed.
9. Either end of a square-rigged vessel's yard.
10. What the skipper does aboard his ship.
11. What the tide does thru the Gate.
12. Too much grog will give you these!
13. Another compass point.
15. What the bosun called the mate (behind his back!)
21. Enemies.
22. What you did when the alarm-clock gonged.
24. Keep this off your escutcheon.
25. To brag.
26. Leaves out.
27. A swell serving of "groceries".
28. Didn't feel so good.
29. Brake horsepower—heavy duty. (We apologize!)
30. A bad act.
31. A pretty little flower — and we don't mean Pansy.
32. He drew five of a kind.
33. Confined.
36. Mazuma in Mussolini-land.
37. Put this with No. 2 vertical and you'll have a favorable blow.
39. What Marc Anthony tried to borrow.
40. What the passenger pays.
42. Personal "build-up".
43. Here's that French company again!
46. This puzzle-author's initials.
47. "Good Morning!" (Abbr.)
48. Conjunction.

LAST MONTH'S SOLUTION



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PACIFIC MARINE REVIEW

JUNE 1936

Flying Bridge S.S. Monterey

Photo: Courtesy Matson Line

Official Organ

PACIFIC AMERICAN STEAMSHIP ASSOCIATION

SHIPOWNERS ASSOCIATION OF THE PACIFIC COAST

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PACIFIC MARINE REVIEW

VOLUME XXXIII JUNE 1936 NUMBER 6

Editorial Comment »« »«

Responsibility of Organized Labor

Many of the conservative leaders of American labor organizations realize their responsibility under the present set-up of "collective bargaining" in relation to industrial disputes. They accept and are guided by the principle that each party to an agreement must keep its end of the bargain and fulfill all its obligations thereunder. Their experience and their common sense both testify to the axiomatic truth that no right to bargain in any form can be of any permanent value unless it is based upon the good faith and the responsibility of all parties concerned.

Such men form, we believe, the majority, both in the leadership and the membership of organized labor in the United States. They regard the right and privilege of "collective bargaining" as a constructive measure to be used for building up a permanent policy of friendly personnel relations in the United States.

On the other hand, a rather powerful and very vocal minority of organized labor in America today regards the right of "collective bargaining" as the entering wedge for a campaign of socialistic and even communistic guerilla warfare against the American system in industry.

They climb by collective bargaining into positions more favorable for the spread of their poisonous propaganda, and from which they can more easily direct their plans for irritating and un-economic activities among their membership.

Maritime union labor of the Pacific Coast is at present engaged in a struggle to shake off its shoulders the burden of such leadership. In this effort, the Pacific Coast marine unions are being assisted by the national and international bodies with whom they are affiliated, including the American Federation of Labor, the International Seamen's Union, and the International Longshoremen's Association.

In this struggle, the conservative elements of Pacific maritime labor have the sympathy and the support of all right-minded citizens. In the long run they are sure to win, because they are right. The road to victory, however, can be made much easier and much shorter if the federal administration will take a firm stand alongside this conservative element. The radical and communistic leadership of labor in the United States must be taught in very forceful fashion that this country is not a healthy locale for that type of activity.

"Eight sailors—seven wished to steer—
That ship will never come to port, I fear."
. . . .Chinese proverb.

Direct Subsidy Legislation

A critical situation has arisen in Congress with regard to ship subsidy legislation, warns the Chamber of Commerce of the United States, Harper Sibley, president.

The Chamber generally supports the Copeland Bill (S. 3500), with modifications, and opposes the Guffey Bill (S.4110) as threatening a return to government ownership of shipping. The Chamber is on record for direct subsidies.

The following main features of the Copeland Bill have the Chamber's approval:

A definite policy of private ownership and operation of the merchant marine.

Provision for carriage in American bottoms of our domestic water-borne commerce and a substantial portion of our export and import trade, including service on all essential trade routes.

Provision of adequate and suitable vessels for naval and auxiliary use in time of war or national emergency.

Construction and operating subsidies to offset our higher shipbuilding and operating costs.

Requirements in subsidy contracts for building of suitable new vessels.

Establishment of a single governmental agency to handle administration of ship subsidy contracts.

Vesting of regulatory authority over foreign commerce in a quasi-judicial body.

Other features, the Chamber holds, should be eliminated or changed to meet the requirements of a successfully privately-owned and operated merchant marine. These features are listed as follows:

Mandatory cancellation of existing ocean mail contracts should be eliminated.

Purchase and sale of vessels by the Maritime Authority and construction of merchant vessels in navy yards should not be permitted.

The system of limitation of profits is wrong in principle. Recapture of profits, recently abandoned by Congress as a failure in the case of the railroads, whose earnings are reasonably stable, is most inappropriate for such industries as shipping and shipbuilding.

Provisions for wage-fixing by the government for ships receiving aid would violate principles of private operation and management, which should be preserved in the shipping field as elsewhere.

"The Guffey Bill," the Chamber declares, "would almost inevitably result in a large-scale return to government ownership of shipping. Although ostensibly intended to establish a privately-owned and operated merchant marine, it includes provisions which would make this practically impossible."

"Thousands of barnacles small and great
Cling to the jolly old Ship of State—
So don't be alarmed if she seems to crawl—
It's really a marvel she goes at all."

E. F. H. in "Punch"

Pacific Marine Twenty-Five Years Ago

In June, 1911, our then editor and publisher, H. B. Jayne, himself an Englishman, viewed with alarm and wrote a strong lead article condemning the proposed Anglo-Arbitration Treaty. He preferred, as an American citizen, "that the United States should preserve its traditional policy of 'freedom of action' and 'freedom from entangling alliances or treaties.' "

He noted with interest that the Canadian naval service program and the Canadian act to encourage dry docks had resulted in many British shipbuilding firms and their Canadian associates filing applications under this act and announcing their intentions of qualifying as bona fide Canadian firms in the shipbuilding business.

He expressed his doubts of the commercial feasibility of an "All Red British route to Australia and New Zealand via Canada and using 20-knot steamers on the Pacific" as was then proposed.

He deplored the Mexican revolution, which had driven out Diaz and Limantour and dreaded the results that would surely ensue from the political efforts of the new and inexperienced administration.

A. F. Haines, then Tacoma agent for the Blue Funnel Line, had just returned from London, and made the announcement that on the opening of the Panama Canal, his company would establish a round-the-world cargo and passenger service with half of the fleet running eastward via Suez and Panama, and the other half running westward via Panama and Suez.

R. P. Schwerin of the Pacific Mail Steamship Company had just closed an agreement with the Panama Railroad Steamship Company whereby the through rate, Pacific coast ports to New York, was to be divided—60 per cent to Pacific Mail, 40 per cent to Panama Railroad Steamship Company.

Two submarines of the Holland type, Skipjack and Sturgeon, had recently been launched by Fore River Shipbuilding Company.

The United States battleship, Wyoming,—not to be confused with the U. S. Coast Defense vessel, Wyoming, built at Union Iron Works about 1900—had been launched by William Cramp Shipbuilding and Engineering Company on May 25.

Shipbuilding contracts just let or pending included: four large colliers for U. S. Navy; two trans-Pacific liners and one Pacific coastwise liner for Canadian Pacific; another superliner (sister to the Imperator) for the Hamburg-American Line; and a new barge dredge for the Standard American Dredging Company of San Francisco.

Recorded improvements in marine machinery and equipment included:

The new gyroscopic compass being installed on the torpedo boat destroyer, Drayton, at the New York Navy Yard (undoubtedly this was a Sperry installation, although no name is mentioned). It is stated "Later it is planned to apply the gyroscope to prevent rolling at sea."

A new patented system devised by Mr. Frank Honeak of Bremerton, Washington, for transferring coal or other materials from one vessel to another at sea;

A short resume of the progress of the diesel engine in marine propulsion, showing 250 ships fitted, including submarines, and ranging from 300 to 5000 horsepower per ship;

It was recorded that the Alaska Fish Company had transformed "the barge, Glory of the Seas, an old time clipper ship, into a floating cannery."

In this issue at the editorial masthead there appears for the first time the well-known name of Captain E. Francke as associate editor.

Criticism Versus Accomplishment

Presenting the Sides of the Merchant Marine Picture

An Address by James Craig Peacock, Director of the Shipping Board Bureau, Department of Commerce, before the Propeller Club of Baltimore, Md., on National Maritime Day, May 22, 1936

The past several years have been a period of great distress for world shipping. Subnormal cargo offering, low freight rates, and severe competition for such business as still moves in international trade have caused shipowners everywhere to concentrate their efforts on the desperate struggle for survival. Not all of them have succeeded in weathering the economic storm. There have been failures and receiverships, an unprecedented laying up of tonnage, consolidation of services, restricted or staggered sailings, and a general cutting down of overhead. High tariff walls, import quotas, and other trade barriers, coupled with subsidies for domestic production and fluctuations of foreign exchange—all, I take it, manifestations of the post-war trend to economic nationalism—lie at the root of the shipowner's troubles. To add to his perplexities, there has been a marked, relentless, and heartbreaking rise in operating costs.

Faced with dwindling revenues and steadily mounting costs, shipowners the world over have appealed more and more to their governments for financial support. That they have not appealed in vain is shown by the fact that government aid to shipping is now the rule rather than the exception. If the Great War accentuated the value of merchant shipping, post-war developments have convinced the maritime nations that their merchant marines must be maintained by whatever means possible—if not by private initiative, then by the taxpayers, through the medium of government aid. Our own Admiral Gleaves, Chief of Convoy Operations during the World War, put the case tersely when he said, "The outstanding lesson which the war has driven home to us is the value both in peace and in war of a prosperous deep-sea merchant marine."

● *National Aids to Shipping*

At no time in the world's history has competition on the oceans been more intense than during the past fifteen years. In this period all of the countries of our principal maritime competitors have adopted a strong national shipping policy. They have assisted their private shipping industry to survive the terrific slump in world trade, with its disastrous effect on shipping, by the liberal extension of Government credit, or by private credit guaranteed by the Government; the renewal and extension of contract services in their essential trade routes; construction loans at low rates of interest; construction bounties; navigation bounties and other forms of aid. The adherence to such a policy by these countries has enabled foreign shipowners to scrap millions of tons of obsolete ships and to build new ones. It has not only enabled our competitors to maintain their relative competitive status in the trade routes of the world, but has greatly enhanced and strengthened their position by the introduction of high-speed passenger ships, combination ships, and fast cargo liners. It would have been impossible for private capital to finance, without liberal Government assistance, such ships in the important North Atlantic passenger service as the Rex, the Normandie, and the Queen Mary.

Under these circumstances how can American shipping meet foreign competition successfully without adequate Government assistance when the capital and operating costs of American ships are far greater than those of any of our foreign competitors?

● *Adverse Criticism*

During the depression American shipping has experienced all the vicissitudes which have beset the merchant marine of other nations. In addition it has had to face, continuously for the past three years, a heavy barrage of high-powered criticism, originating, strangely enough, not in the countries of its competitors, but among our own people. From every direction the pitiless spot-light of publicity has been turned upon its every weakness and shortcoming, leaving its virtues obscured in the shadows.

Such a steady stream of adverse criticism has poured forth from Congressional and departmental investigations and hearings and debates, from news and editorial writers and columnists of influential papers, from after-dinner speakers, and even from radio commentators, that the man in the street can scarcely be blamed if he has come to believe that our shipping situation constitutes a veritable public scandal and nothing more.

Many charges have been made against the operators of American ships. These charges have been given wide circulation and have gained wide credence. Many of them are one-sided and carry their own refutation, as, for example, the sweeping charge in a recent report that instead of an adequate American Merchant Marine, the Merchant Marine Act of 1928 has produced unconscionable exploiters, intent upon wringing every possible penny from the public purse, while giving an absolute minimum of service in return.

Admittedly the Act of 1928 has failed to produce an adequate merchant marine, since it has not brought about the building of much-needed cargo liners. But when we say this we should at the same time present the other side of the picture and add that the 33 vessels built under the Act's provisions, at a cost of approximately $144,500,000, are, for the size and type, as modern and efficient as any in the world, and that they represent the finest merchant fleet ever assembled under the American flag since the advent of steam.

Much the same objection may be taken to a reference in the same report to what is called the myth of private ownership, and to the repeated attempts made to show that the Government's mortgage liens and equities are so great that our merchant marine is in effect owned by the Government, rather than by private American interest. Here again only a part of the picture is revealed by the flood-light of unfavorable publicity which has been thrown upon the merchant marine.

● *Constructive Help Needed*

I hold no brief for the individual American shipowner, but as Director of the Shipping Board Bureau I do hold a brief for the American Merchant Marine. You will understand that in saying this I in no wise condone the abuses and improper practices which have been indulged in by some members of the industry. I offer neither apologies nor excuses for those who have overstepped the proprieties, or who for personal or corporate gain have been guilty of breach of faith, if not of contract, with the American people. The point I wish to make is that there has been enough criticism of the abuses of the past. Surely the American Merchant Marine finds its natural economic handicaps burdensome enough, without this added handicap. What it sorely needs—though in some quarters it is not the fashion to say so—is sympathetic and constructive help. We cannot permit the recent flood of adverse criticism to make us waver in our allegiance to one of the country's most essential industries. We cannot proceed on the false assumption that its greatness has forever vanished—that its former virtues have degenerated into vices—that no hope remains of perpetuating its glorious traditions.

● *Outstanding Accomplishment*

The oustanding accomplishment which must be placed to the credit of the American Merchant Marine in recent years is the maintenance, on every one of the country's essential trade routes, of regular and dependable service during this entire period of unparalleled stress in shipping and foreign trade. Here is a record that will bear favorable comparison with the showing made by any other merchant marine in the world, a record which is all the more remarkable when we consider the obsolete types of cargo ships which comprise the greater part of our fleet. Not only have these services been maintained, but the percentage of American waterborne foreign commerce carried in American bottoms has held constant, even during the worst years of the depression. What better testimony could be offered to prove the zeal and enterprise displayed by American operators in the face of conditions which have driven many of their foreign competitors out of business?

For the past fourteen years American ships have carried an average of approximately 34.3 per cent of the total value of our foreign waterborne commerce, ranging between a low of 32.2 per cent in 1926 and a high of 36.5 per cent in 1933. Now in analyzing these figures the interesting fact develops that during the past seven years—the period of the great depression—the yearly average is found to be somewhat higher than for the seven years preceding the depression. Does anyone suppose that this just happened by chance or accident? I for one give credit to the business acumen, the ingenuity, and the dogged determination of the American shipowner, who, refusing to take the depression lying down, rolled up his sleeves, improved and intensified his methods of freight solicitation, and more than maintained his relative position while the rest of the business world was in the doldrums praying for a favorable breeze.

● *New Ships Built*

There can be no doubt that the new ships constructed under the much criticized Merchant Marine Act of 1928 have helped American operators to hold their own during the trying years of the depression.

The two splendid passenger vessels built for operation in the North Atlantic have proved so popular that they have revolutionized the entire passenger rate and classification structure in the world's outstanding ocean passenger route. During the travel season accommodations on these vessels have been taxed to capacity. For some months negotiations have been under way looking to the construction of a third vessel of the same type and size, though with still more modern equipment, with a view to rounding out this service on a weekly basis and securing a still greater share of the rich passenger traffic of the North Atlantic.

Four new vessels built for service from North Atlantic ports to ports on the Mediterranean Sea have also given an excellent account of themselves, as have the five outstanding passenger ships built under the provisions of the 1928 Act for service on the Pacific. The all-round efficiency of these vessels, coupled with their excellent service and moderately priced fares, accounts for the high place they have won in the estimation of discerning patrons. If the Merchant Marine Act of 1928 had done nothing else, it would still deserve our gratitude for the way it has demonstrated that whenever the American shipowner is in a position to offer service comparable with, or superior to, the service furnished by foreign shipowners, the patronage of American shippers and travelers will gravitate to the ship flying the American flag.

The four new combination cargo and passenger vessels built for service to the west coast of Central and South America tell the same story. For their type and size they are as attractive and efficient as any ships ever built, and like other vessels constructed under the provisions of the Merchant Marine Act of 1928 they have won great favor with the shipping and travelling public. In view of recent criticism of American ships from the standpoint of safety, I think it well to point out that all the passenger carrying ships built with Government aid since 1928 have exceeded the requirements laid down by the London Convention for Safety of Life at Sea, notwithstanding that this important treaty has not yet been ratified by the United States.

● *Cargo Liners Needed*

All told, 33 new and splendid ships, costing approximately $144,500,000, have been built under the 1928 Act. The conversion or reconditioning of 42 old vessels, with a view to increasing their speed, installing refrigerator space, or making other betterments, has involved an additional expenditure of $17,700,000, making a total outlay of approximately $162,200,000, for modernizing the fleet during the depression years. The result is that our immediate needs in our principal passenger carrying trades are, with a few notable exceptions, reasonably well taken care of. Our need for new cargo liners remains, however, a matter of very real concern.

A fair appraisal of the figures quoted will show the unfairness of the highly critical views so frequently expressed as to the progress made in building up American shipping since the passage of the Merchant Marine Act of 1928. When we consider the employment benefits accruing to American labor through the expenditure of $162,200,000 for building or reconditioning these 75 ships, the added millions paid to American seamen employed to run the newly built vessels, and the increased prestige enjoyed by the American-flag services in which the ships have been operated, it is decidedly unfair to imply that the Merchant Marine Act of 1928 was barren of worthwhile results. The chief defects of the Act were that it disguised the nature of the subsidy; that it did not make mandatory the replacement of obsolete tonnage; and that the method prescribed for determining the amount of Government aid was loose and open to abuses if not properly administered. More than counter-balancing these admittedly serious defects, however, the fact stands out—and I believe that it will be given full recognition when the maritime history of the post-war era is finally written—that but for the subsidy provisions of the Act of 1928, few American lines, other than the so-called industrial carriers, would ever have survived the depression.

● *Shipowners Repay Loans*

The critics charge that while American shipowners have taken advantage of the liberal provisions of the 1928 Act to build or recondition a number of ships, and have also purchased Government tonnage at market prices or less, they have been so slow in meeting their financial obligations to the Government that, in effect if not in law, the ships are owned by the mortgagee—in other words by the Government. Here again the spot-light of adverse criticism reveals only part of the picture. I would like to show you the other part—made up of facts which I think speak for themselves.

On August 9, 1933, when the Presidential order abolishing the Shipping Board and transferring its activities to the Department of Commerce became effective, outstanding ship sales and construction loan mortgages amounted to $154,742,561.80. Today that total has been reduced to $105,728,539.77. In other words, in less than three years $49,014,022.03 or almost one-third of the total, has been paid back to the Government, notwithstanding that by the terms of the loans most of them were to run for 15 or 20 years.

On the same date—August 9, 1933—thirteen active companies were in arrears on such mortgages. Since then only two small companies have been added to the list while on the other hand six of the original thirteen have completely paid up all arrearages. A seventh has for more than two years been making regular payments on a schedule which has already reduced its arrearages from $853,800 to $169,600, with every indication that it will be completely caught up on its payments by November of this year. Two of the six other companies still in default are in appreciably sounder financial condition than they were a year ago, and only two of them have had occasion to resort to receivership.

In all fairness to the American shipowner these facts deserve as widespread publicity as that which has been accorded the pessimistic reports of recent years. I do not believe that the American people want Government ownership and operation of industry, even though the industry be one which is so highly specialized, so difficult to manage, and so hazardous from the standpoint of financial returns as the American Merchant Marine. Our former maritime glory, wrested from our competitors in those far-off days of "wooden ships and iron men," was achieved under private American ownership. On the other hand our post-war experience with Government ownership and operation was marked by so much waste and inefficiency that I, for one, hope that it will never be repeated.

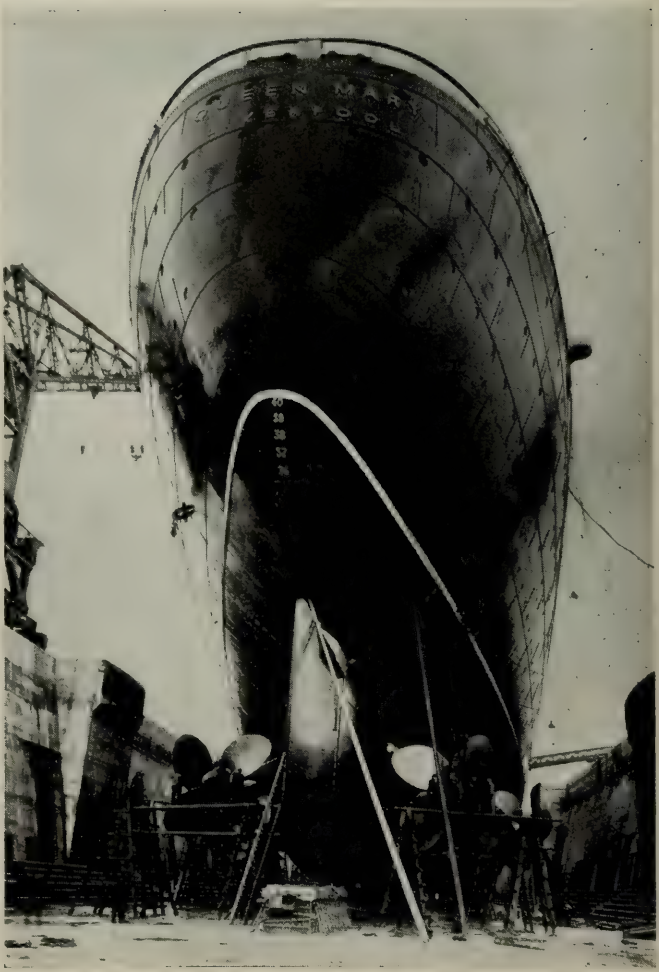
Sea Scouts Splendid Service

A saga of heroic adventure, unselfish service and spirited cooperation! That is the story of the Sea Scouts, senior program of the Boy Scouts of America, whose valient work throughout the flooded areas of the country during March has elicited widespread and enthusiastic commendation.

More than 60 Sea Scout units participated in the relief work, their personnel numbering approximately 800 Sea Scouts and Sea Scout leaders. The units saved, it is estimated, more than 3,000 persons in 13 states.

Sea Scouting is attractive to many boys because of its romance, adventure and educational possibilities. Now there are more than 2,000 units with some 30,000 active members in the United States. A boy must be 15 years old or over to join this organization.

World's Heaviest Ship in World's Largest Dock Queen Mary at Southampton



CHARACTERISTICS OF S.S. QUEEN MARY

Length on water line	1004 feet
Length overall	1018 feet
Beam overall	118 feet
Loaded draft	40 feet
Heights:	
Keel to top of superstructure	135 feet
Keel to top forward funnel	180 feet
Keel to masthead	234 feet
Waterline to masthead	194 feet
Gross measurement	80,773 tons
Loaded displacement	77,500 tons
Propulsion turbines	4 sets
Propellers	4
Shaft horsepower	200,000
Boilers, watertube	27
Steam temperature	700 deg. F.
Steam pressure	440 pounds
Sea speed, normal	30 knots
Top speed on trials (estimated)	32.84 knots
Electric generating capacity	9,100 k.w.
Passenger capacities:	
Cabin class	735 persons
Tourist class	760 persons
Third class	580 persons
Total crew personnel	1125 persons

. . . . *Cunard*
Super Liner Queen Mary

Greatest of Scotch Productions—Pride of the British Merchant Fleet—She is the Latest Word in Atlantic Blue Ribbon Competition

It takes a heap of words to adequately describe those gigantic fabrications known as superliners. They embody in their design, construction, propulsion, equipment, and decoration somewhat of the best of every profession and handicraft known to man. Who, then, would attempt to portray their details within the space limits of Pacific Marine Review? Certainly not this editor.

There are, however, certain very interesting general characteristics about this ship that are of vital importance to the naval architect and the marine engineer, and in this article we shall concern ourselves with the most outstanding of such features.

At the outset, the Cunard Steamship Company had set as a goal the building of two ships that would have sufficient power to make possible a weekly sailing from New York and from Southampton. Each ship, therefore, would have to make a round trip every two weeks. With the necessary port time, this meant speed enough for a crossing in four days, or better than 32 knots. The vessel would have to be large enough to provide passenger accommodations sufficient to make such speed commercially profitable and to float enough power-generating and power-applying equipment to guarantee the speed. Tentative designs were prepared and a tremendous quantity of experimental model towing work was done before the final design was accepted. This final design, except for the adoption of the modified cruiser stern and stepped superstructure decks aft, is along strictly orthodox British super steamship lines, and might almost be called an enlarged Mauretania.

There is no bulbous bow, no Maierform, no Yourkevitch patented lines, none of the special features that have had so much publicity in recent years . . . just a refinement of all the best in orthodox naval architectural design. For the speed contemplated and apparently obtained, her superstructure is only very moderately streamlined, and her funnels are

The various sport and promenade spaces of the Queen Mary comprise nearly three acres of open deck equipped with every device that ingenuity can suggest for the comfort and diversion of passengers.

Queen Mary on her trials running approximately 32 knots.

oval in section with no suggestion of pear or teardrop shape.

She will therefore be a test ship, in that every naval architect will be watching her performance keenly and comparing that performance with those of the most prominent vessels, whose lines embody one or more of the newer specialized designs.

Queen Mary's designers and her builders have also loudly declared their faith in orthodox materials, and boast that their product is the heaviest vessel afloat. Her displacement is nearly 10,000 tons more than that of the Normandie. Building to Lloyd's highest specifications, with orthodox ship steel, her constructors made safety the controlling factor, and carried the double bottom tank construction over the entire bottom below the water line. The six-foot space between the two bottoms is divided into 160 water- and oil-tight compartments.

Very little welding was used in fabricating the hull, and over 10 million rivets fasten her plates and framing. Here, again, every port superintendent and managing operator will be vitally interested in watching comparative maintenance costs.

Queen Mary's engines are the most powerful ever installed on a merchant vessel. Four sets of Parsons triple expansion four-cylinder turbines drive four propeller shafts through single reduction gearing. Each of these sets generates 50,000 shaft horsepower when supplied with steam at 440 pounds gage pressure and 700 degrees Fahrenheit temperature. This steam is supplied by 24 watertube boilers of the Yarrow Express type.

This design, also, is very conservative. Tremendous savings in weight and fuel might have been attained by doubling this steam pressure and raising the temperature to 800 degrees Fahrenheit, but conservative Scotch owners and builders of this great ship would have none of it, and, right on the Clyde, where modern marine high pressures were started at 500 pounds fifteen years ago, they insist on 440 as an upper limit for the highest power marine propulsion plant.

When it comes, however, to equipment for safety of passengers and ship, and for comfort and amusement of passengers, there is prompt acceptance and inclusion of all the latest devices. Much of this demands electricity in many applications, and the electric load on this ship is said to be the greatest afloat. Her seven turbo-generators, supplied with steam from three special boilers, have a combined capacity of 9100 kilowatts.

Among the features which demand this auxiliary power are:

Ten thousand fixtures with over thirty thousand lamps;

Twenty-one electrically operated elevators;

Complete pressure ventilation to all passenger and crew accommodations;

Largest air conditioning plants afloat;

A fifteen hundred kilowatt load called for by the complete electrification of the galleys and pantries including all cooking and baking, with the exception of charcoal grills for steaks and chops;

All deck machinery including windlass, winches, and capstans;

Practically all pumps including fresh water service, sanitary service, fuel oil transfer, fire main service, bilge clearing service; and refrigeration machinery.

In all, there are 528 electric motors with a combined total of 13,500 horsepower. The electric wiring has a length of over 325 miles.

● The Stainless Galley

When, on May 27, the new Cunard White Star superliner, Queen Mary, leaves Southampton on her maiden voyage to New York, she will be equipped with probably the most complete and most modern galley ever carried by an Atlantic liner. In fact, only a galley of vast proportions and superior appointments could adequtely handle the catering requirements of the 2,100 passengers and 1,400 officers and crew.

The main galley is placed between the cabin and tourist dining saloons on "C" deck, with the forward end arranged for the cabin class, and the after part for the tourist class. This spacious unit includes such subdivisions as baker's and confectioner's shops, cold larders, fruit and salad rooms, vegetable preparing rooms, meat and fish shops, sculleries, still rooms, and numerous pantries for the 200,000 pieces of earthenware, glass and china. In all, nearly one acre of space has been devoted to the preparation and service of food.

Apart from its vast size and enormous electrical requirements, the most striking feature of the cooking department, is the extensive use made of stainless steel. Wherever possible, in the construction of dressers, cupboards and drawers wood has been eliminated and stainless steel substituted. It is interesting to observe that the stainless-steel-covered working tables and dressers if placed end to end would considerably exceed the total length of the Queen Mary.

Nearly fifteen tons of stainless steel were used in the construction of the ranges, grills, bakers' ovens and other equipment. In the cabin galley there are two large ranges, each with eight ovens, and a smaller range with three ovens. All the mountings, handrails, rolling guards, doors, and door handles of these ranges are of stainless steel. The main service hotpress is 55 feet long and is constructed of stainless steel. Other equipment such as the salamanders is also finished in stainless steel.

A pleasing effect has been obtained by the use of contrasting finishes of mirror-polished and matte-polished surfaces. But even more important than stainless steel's attractive appearance is its cleanliness and durability. This brilliant metal is not only easily cleaned, but its strength and hardness make it particularly resistant to denting and scratching.

The equipment for the tourist class galley follows generally the same lines as that for the cabin class and is largely of stainless steel. In addition, there is a separate galley for the third class passengers and crew and a galley for the veranda grill on the sun deck. Passengers aboard the Queen Mary will be assured superb cooking by skilled chefs in a group of the world's finest galleys. And stainless steel assures that these galleys will retain forever their brightness and cleanliness.

● Air Conditioning Installation

The air conditioning installation aboard the Cunard White Star superliner, Queen Mary, includes all the features of the most modern land installations for both summer and winter weathermaking. The apparatus which serves the main dining salon, including four private dining rooms, tourist dining salon, main lounge and main beauty parlor, is capable of maintaining exceptionally comfortable conditions of temperature and humidity in the extremes of New York weather, ranging from zero degrees Fahrenheit in winter to 100 degrees Fahrenheit in summer with every possible variation in humidity which can naturally occur. The installation has the necessary capacity for cooling, heating, de-humidifying, humidifying, cleaning and delivering air in order to cope with such extremes of weather.

There are actually five independent air conditioning plants comprising supply and exhaust fans, de-humidifiers, steam heaters, automatic air dampers, temperature and humidity controlling equipment, etc. These equipments which have a combined capacity of nearly 7,000,000 cubic feet per hour are of Carrier design, installed by the British associate of Carrier-Brunswick International, Inc.

Two of the plants serve the main dining salon which is the largest room ever built into a ship. This salon which is three decks high extends the entire width of the vessel, namely 118 feet, is 160 feet long and covers an area of almost one-half acre. Four private dining rooms, also air conditioned, are adjacent. The other three air conditioning plants are for the tourist dining salon, the main

lounge and beauty parlor, respectively.

Three sources of refrigeration are included in the complete equipment. The largest part of the refrigerating effect is provided by means of a steam ejector type water cooler which is located in the aft auxiliary generator room. The refrigeration for the tourist salon is supplied by one of the standby CO_2 plants forming a part of the stores refrigerating system. The beauty parlor has an independent methyl chloride refrigerating machine located alongside the air conditioning plant and near the space served. The refrigeration for all the larger plants is distributed by means of chilled water which is sprayed in the various dehumidifiers. In the case of the tourist salon this water is cooled in the CO_2 evaporator at tank top level aft which is interconnected with the refrigerating plant in an adjacent compartment.

The refrigerated water for the plants serving the main dining salon and lounge is cooled from the steam ejector water cooler. This machine is of interest because it is the first to be installed aboard any ship for air conditioning purposes. In principle, the machine is extremely simple, the cooling being effected by continuously evaporating a small fraction of the water circulated. Since this evaporation has to take place at temperatures between 40 degrees Fahrenheit and 50 degrees Fahrenheit, a very high vacuum must be maintained in the evaporating chambers. This is done by means of a series of steam ejectors which extract the water vapor from the evaporating chambers, compress it and discharge it, together with the ejector steam, into a surface condenser.

Another outstanding feature of the Queen Mary's air conditioning installation is the system of air distribution. In all the air conditioned rooms on the Queen Mary the necessarily large volume of air is distributed without draft. The air movement is at such low velocity that the air currents are not noticeable. The means of distribution are incorporated and concealed in the decoration, without detracting from the architectural detail.

The various air conditioning plants are of necessity distributed throughout the ship and in some cases somewhat remote from the rooms which they serve. Also the hourly variations in the weather and the occupancy of the rooms necessitate continuous adjustment to suit the prevailing conditions. In order, therefore, to facilitate the operation of the plants, automatic controls are fitted which effect these adjustments as required and with the minimum attention from the engineers.

The automatic system is pneumatic. The thermostats in the air conditioned spaces and on the various plants regulate the flow of compressed air to motors which adjust dampers and automatic valves which in turn control the condition of the circulated air. In this way the temperature and humidity of the air supplied to the rooms are varied automatically to maintain comfortable internal conditioning irrespective of the weather and variations in the occupancy.

Although the various air conditioning plants differ in arrangement, each comprises essentially one or two supply fans, Carrier marine type dehumidifier, pre-heater and main heaters, one or more exhaust fans and various automatically operated air dampers.

The dehumidifier is the source of the conditioned air and, therefore, the most important component. It consists of a heavy galvanized sheet steel casing with a tank beneath; arranged in the casing is a series of special spray nozzles through which water is pumped at a high enough pressure to create an extremely dense bank of mist. The air to be conditioned is drawn through this mist, the temperature of which determines the final condition of the air.

In summer the water sprayed in the dehumidifiers is cooled by means of refrigeration and so both cools and dehumidifies the air. In winter the dehumidifiers reverse their function and add moisture to instead of extracting it from the air passing through them. The fine sprays of water thoroughly wash and clean the air so that impurities flow away with the waste water.

All the fans associated with the installation have direct-coupled driving motors and are generally provided with speed control. Special precautions have been taken to insure that all fans shall be silent and vibrationless so that no noise is communicated to the spaces served or the ship's structure.

Owing to the great difference in temperature and humidity between the air surrounding the plants and that supplied by them to the several rooms, many thousands of square feet of cork slab have been used for insulating the equipment and ducts.

The air conditioning installation on the Queen Mary is not only by far the largest system for Manufactured Weather ever installed aboard ship, but also the most modern plant of its kind in the world. The cooling capacity is equal to that from half a million pounds of ice daily. Coming in a year of the Silver Jubilee of the air conditioning art as pioneered and developed by Willis H. Carrier, the Queen Mary is a prophetic illustration of the comfort that will be found in the homes of the future.

● Radio Communication

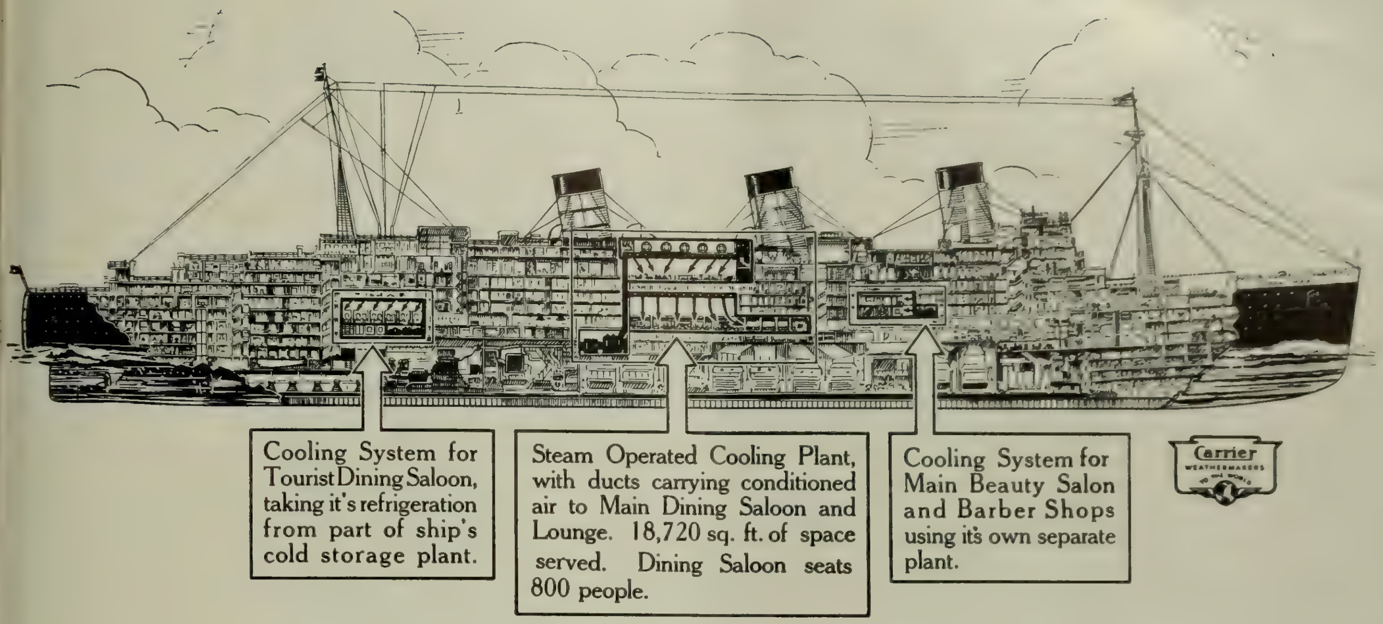
The Queen Mary will be the greatest communication center afloat. The International Marine Radio Company, Ltd., of London, an associate of the International Telephone and Telegraph Corporation, New York, has installed four major transmitters and eight receivers, capable of working on 31 wave bands and with an operating capacity of 150 radiograms an hour. Fourteen wireless operators are carried, and continuous service will be maintained at the main radio operating room. A passenger in any one of 500 staterooms will be able to get prompt telephone or telegraph connection with any part of the world, and with 93 per cent of the world's telephones.

Queen Mary's radio will be used for the transmission and reception of broadcasts.

Exide batteries, supplied by the Exide Storage Battery Company, are used for the emergency radio installation, for starting the 75 kilowatt emergency lighting generators, and for the normal operation of the ship's telephones.

The new type Kolster radio direction finder is installed on the bridge of the Queen Mary. The salient features of this instrument are described and illustrated on page 156, Pacific Marine Review, for May, 1936.

Talking picture apparatus of the latest type is installed in the public


Cooling System for Tourist Dining Saloon, taking it's refrigeration from part of ship's cold storage plant.
Steam Operated Cooling Plant, with ducts carrying conditioned air to Main Dining Saloon and Lounge. 18,720 sq. ft. of space served. Dining Saloon seats 800 people.
Cooling System for Main Beauty Salon and Barber Shops using its own separate plant.
Carrier

rooms of all three classes. In the cabin class playroom, the youngsters may have Mickey Mouse, Popeye, and all their other favorites in an automatic movie arrangement operated by pressing a button.

There are 24 motor lifeboats, each with a capacity for 145 persons. Two of these boats in addition to being equipped with radio telegraph apparatus, are fitted for radio telephone.

Extensive provision of fireproof bulkheads, fire doors in passageways, fire alarms and extinguishing systems and a special firemen detail in the crew give assurance of practicable safety from the most dreaded of sea perils.

For navigation, the bridge of Queen Mary has several unique features in construction and equipment. For the full width of the bridge, the upper edge of the forward bulwark is equipped with a venturi nozzle slot effect which acts to form an inclined screen of high velocity air so that wind, rain, sleet or snow are deflected upward over the heads of officers on watch. The wings of the bridge extend 12 feet beyond the side of the hull, so that lookouts in the "pillbox" get a clear view of the entire length of the ship.

Twin steering wheels, and a complete duplicate set of steering telemotors insure adequate control of the most powerful hydro-electric steering mechanism ever installed. A master gyro compass with several repeaters enables the navigating officer to set a true course, and a Sperry gyro pilot provides automatic steering to keep the ship on the course set.

Two Sperry high intensity arc searchlights are mounted on her wheel house. The "crow's nest"—130 feet above the water, and reached by 110 ladder rungs inside the hollow steel foremast—is heated by electricity and communicates with the bridge through signal bells and telephone.

Thus—in this great floating town—you may go shopping in the great central hall for almost anything you may need, and if you are in doubt about a purchase you may step to a telephone kiosk on the corner and call up your hubby, your banker, your lawyer, or what have you, for confirmation. You may cross the ocean if you so desire, without seeing its beauty, feeling its motion, smelling its salty tang, or hearing its billows roar. Your life need be no whit different during that four-day crossing from what it would be in an ultra first-class hotel ashore, if you stay inside the hotel.

Prize for Diesel Inventions

Inventors with inclinations toward diesel engines are given encouragement through the offering of a $1000 cash prize for the best diesel invention submitted during the next twelve months. A perpetual silver trophy has also been offered on which each year's winner's name will be inscribed. The $1000 prize and the Diesel Inventors Trophy will both be given by Mr. Ralph Hemphill, one of the country's strongest advocates for diesel engines. He is also president of the Hemphill Diesel Engineering Schools, Inc., with schools located at New York, Detroit, Chicago, Memphis, Los Angeles, Seattle and Vancouver, B. C.

It is reported that this contest is the first one ever made in the diesel field that offered a cash reward. Cash prizes for inventions in other fields are not new, and many of the improvements in present-day gasoline engines were brought out by similar contests that have been conducted during the last fifteen to twenty years in the gasoline engine field.

It is anticipated that during the next five years there will be as rapid development in the diesel engine field as there has been in the gasoline engine field during the last twenty years. Such being the case, the offering of a prize of this value for the most outstanding improvement in the design, accessory or testing equipment of a diesel engine, will foster the efforts of many engineers and laymen that might not otherwise take an interest in the diesel.

WILLARD F. JONES,
General Manager Marine Department,
Gulf Oil Corporation.

. . . Two New
Gulf Oil Corporation Tankers

Building at Sun Shipbuilding and Dry Dock Company to Isherwood Arcform Design on Longitudinal Bracketless Framing System

The first of two fine new steam tankers building for the American flag services of the Gulf Oil Corporation at the Chester plant of the Sun Shipbuilding and Drydock Company, has passed all tests very satisfactorily and has been delivered to her owners.

These two vessels are of the single-screw two-deck type, having poop, bridge and forecastle arranged for carrying gasoline or heavy oil in bulk, and built to the Isherwood arcform designs, on the Isherwood system of bracketless longitudinal framing. The hulls have the following general characteristics:

Length B.P.	425 feet
Beam m.	64 feet
Depth m.u.d.	34 feet
Depth m.m.d.	25 feet
Draft loaded	27 ft. 6 in.
Total D.W. capacity	11,100 tons
Total tank capacity	85,500 bbls.

The hull is divided by transverse and longitudinal oil-tight bulkheads to provide eight double cargo oil tanks and five wing tanks on each side with one pumproom amidships and one forward.

Design, construction, and equipment are in accordance with the highest classification requirements of the American Bureau of Shipping, and with the rules of United States Steamboat Inspection Service.

A complete detailed description of the Westinghouse propulsion units will be found on page 200, and details of Foster-Wheeler steam generating units on page 199.

All auxiliaries and machines necessary for operation at sea are driven by electric motors. These include:

A horizontal centrifugal main circulating pump of 4900 gallons per minute capacity;

Two rotary lubricating oil pumps, each of 120 gallons per minute capacity at 35 pounds pressure;

Two rotary fuel oil service pumps, each of 3000 pounds per hour capacity at 300 pounds pressure;

A rotary fuel oil transfer pump of 120 gallons per minute capacity at 35 pounds pressure;

A centrifugal Monoblock pump for salt water circulating service, 200 gallons per minute at 35 pounds pressure;

Two centrifugal main condensate pumps, 55 gallons per minute at 85 foot head;

A vertical type centrifugal auxiliary condensate pump, 55 gallons per minute at 85-foot head;

S.S. Gulfbelle, first of two tankers, built by Sun Shipbuilding and Dry Dock Company for the Gulf Oil Corporation on her trial run.

A centrifugal sanitary service pump, 60 gallons of sea water per minute at 60 pounds pressure;

A vertical triplex power feed pump, 60 gallons per minute at temperature of 220 degrees Fahrenheit and a pressure of 400 pounds per square inch;

(All the above pumps are supplied by Worthington.)

A Westco evaporation feed pump, six gallons per minute against a 60-foot head;

Two Burks Super Turbine pumps for auxiliary and drinking water and wash water services;

Carter centrifugal self-priming engine room bilge pump, 150 gallons a minute against a pressure of 35 pounds per square inch;

A Hydroil centrifugal lubricating oil purifier of 350 gallons per hour capacity;

A Cochrane horizontal separator for removing lubricating oil from exhaust steam, capacity 6000 pounds per hour;

Pure lubricating oil is further insured by a Schutte and Koerting magnetic duplex strainer.

The heat exchange auxiliaries include:

A Paracoil evaporator, 30 tons per 24 hours capacity;

Two Paracoil lubricating oil coolers, 120 gallons per minute capacity;

Two Paracoil tubular fuel oil heaters, raising 3000 pounds per hour from 143 degrees Fahrenheit to 300 degrees Fahrenheit;

Two Paracoil tubular condensate coolers, cooling condensate from 366 degrees Fahrenheit to 130 degrees Fahrenheit;

A Paracoil P-80 salt water heater;

A Paracoil feed water filter and grease extractor;

A Worthington marine type deaerating feed water heater with a capacity of 28,000 pounds of water an hour at 227 degrees Fahrenheit.

A McNab electric salinity indicator enables the engineer to keep proper check on his feed water and the conditions of his condenser tubing.

Oil Pumps and Deck Machinery

All movement of cargo and bunker oil is handled with Watrous rotary pumps driven by steam turbines and designed for their rated capacities on a discharge pressure of 80 pounds per square inch. Ten such units are installed in each vessel. Eight of these are in the main pump room amidships with capacities as follows: one of 1500 to 1800 barrels per hour; two of 1000 to 1200 barrels per hour each; one of 500 to 600 barrels per hour; and four for wing tank service of 300 to 360 barrels per hour each. Thus it would be entirely possible under ideal conditions for this tanker to empty a full load of oil in 15 hours. The other two turbine drive Watrous rotaries are located in a separate pump room in the forward hold and are of the same capacity as the four pumps for wing tank service. These two pumps forward are used for fuel oil transfer for water ballast, for bilge service in the fore hold and its pump room.

Five steam driven Worthington pumps are installed. These are a centrifugal fire pump of 500 gallons per minute capacity against a 125-pound per square inch discharge pressure; a 10-inch x 6-inch x 24-inch vertical simplex reciprocating auxiliary feed pump; a 7½-inch x 6-inch x 10-inch horizontal duplex reciprocating fuel oil transfer pump; a 14-inch x 10½-inch x 12-inch horizontal duplex reciprocating general service pump; and a centrifugal auxiliary condenser circulating and ballast pump capable of discharging 1200 gallons per minute against a 25-foot head.

The deck machinery is all steam drive, and consists of two warping winches, two winches for handling dry cargo, and the anchor windlass. An American Engineering Company hydro electric steering gear is fitted aft and is controlled from the pilot house through an electric telemotor. A Sperry gyro-compass with bearing repeaters is part of the standard equipment of the Gulf Oil fleet.

Accommodations

In the steel deck house amidships, under the pilot house, are arranged rooms for the deck officers; the quartermaster; the radio operator and his equipment; the Sperry master gyro compass; and the hospital. In the deck house on the poop are rooms for the engineering officers, galley and pantries; and mess rooms. All seamen and firemen are housed under the poop on the upper deck.

Radio Equipment

Each vessel will be equipped with modern vacuum tube main radio telegraph transmitter, Model ET-3627-A, with the standard marine receiver, IP-501-A.

Each vessel will also be fully equipped with the new Model ET-8003 auxiliary radio telegraph transmitter, operative from either a 12 volt storage battery or from the ship's 110 volt power plant.

Radiomarine Corporation of America will supply, install, maintain and operate the radio telegraph equipment and service, and in addition, will furnish its latest model ER-1445-C radio direction finder.

Refrigerating Equipment

In order to segregate the various food products and insure maintaining the correct temperatures, there are provided two (2) refrigerated compartments, each approximately 700 cubic feet, one designed for the use of vegetables and fruits and the other designed for beef and various frozen products. In addition there is provided a marine type water cooler capable of producing a constant and ample supply of chilled water for the entire vessel.

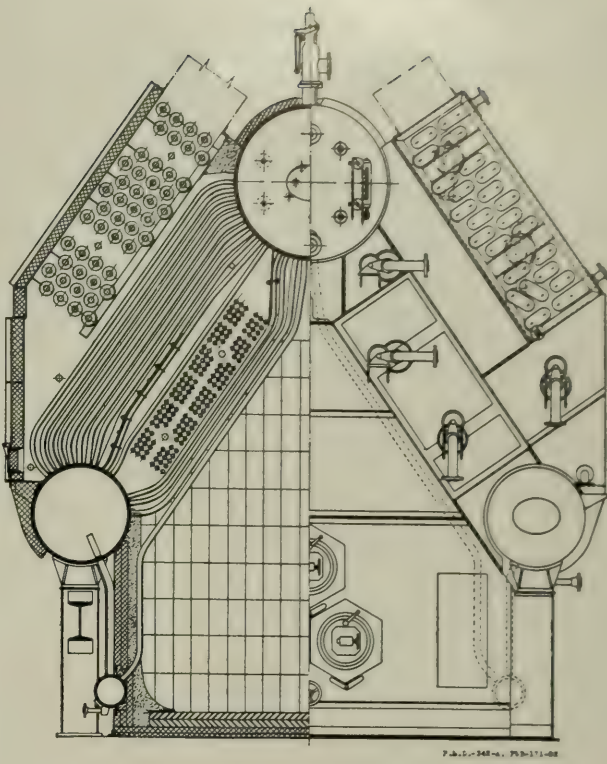
The refrigerating system is of the new Carrier-Brunswick self contained direct expansion heavy duty ammonia type, manually operated but with sufficient control valves to accurately maintain the desired temperatures at all times. The compressor operates at a very conservative speed and is direct connected to a 5 horsepower motor especially designed for marine service.

The temperature control of each compartment is effected by individual valves ad inside each refrigerator there are installed heavy galvanized steel coils to effect the actual cooling.

The water cooler has ample storage capacity to take care of any maximum load condition. This feature of the refrigerating system has been found to be exceedingly beneficial especially when the vessels are in tropical climates.

Each tank will be equipped with deck fittings to take the revolving nozzles of the Butterworth System of tank cleaning. Each unit of this system consists of two revolving nozzles which rotate in both the horizontal and the vertical plane so that the hot salt water spray reaches every point on the inside surface of the tank. 90 gallons of water per minute at 175 degrees Fahrenheit and 175 pounds pressure is thrown by each nozzle.

. . . Steam
Generating Equipment



Sectional elevation of Foster-Wheeler marine type watertube steam generators for Gulf Oil Corporation tankers.

The steam requirements for the two vessels will be furnished by two marine steam generators in each hull. The accompanying drawing indicates that these are of the three drum, "A" type design, having water walls, convection superheaters and economizers. The fuel is fired through three Todd oil burners operating under forced draft.

Briefly, the characteristics are as follows:

Boiler heating surface.........2901 sq. ft.
Economizer surface.............1994 sq. ft.

Total heating surface.........4895 sq. ft.
Steam pressure at superheater outlet 400 lbs. per square inch.
Steam generated per hour 15,000 lbs.
Final temperature, superheater outlet 725 deg. F.
Capacity of desuperheated steam 12,000 lbs. per hour.
Superheat of desuperheated steam 25 deg. F.
Temperature of feed water 220 deg. F.
Designed CO_2 14%.
Efficiency 87%.

These steam generators will be of most up-to-date construction and will be among the early seagoing vessels having rivetless boiler drums—all seams being made in accordance with the Class I welded specifications of the American Society of Mechanical Engineers, and subject to the rigid inspection and tests of the U. S. Steamboat Inspection Service, Department of Commerce.

After the drums are welded, by the automatic alternating current fusion welding machines, they are stress relieved in a gas-fired furnace under accurate control of most sensitive instruments, placed throughout the length of the furnace. The seams are x-rayed with a 300,000 volt x-ray tube —powerful enough to indicate minute deficiencies in the weld, even smaller than the head of a pin.

The steam drum is 42 inches inside diameter, and the water drums are 30 inches inside diameter. The water wall tubes on each side of the furnace are 2 inches in diameter, and the next two rows of boiler tubes are also 2 inches in diameter. This assures adequate water circulation in the hottest gas zones. The balance of the boiler tubes are 1½ inches in diameter; the superheater tubes are 1¼ inches diameter.

The economizer is of the extended surface, cast iron, armored type, built of seamless steel boiler tubes, upon which iron castings are shrunk. These composite elements have six times the heat absorbing surface per lineal foot that is presented by the bare tubes, and the absorption of heat is so effective that the stack temperatures will be in the neighborhood of 300 degrees Fahrenheit.

Wager smoke indicators will be fitted to each boiler.

Generous use of special alloys is incorporated in the modern design and construction. The superheater tubes are of alloy steel and the superheater supports are of alloy, having a chrome content of not less than 25 per cent, where exposed to furnace gases. Boiler baffles at gas temperatures of 1000 degrees or more are also of 25 per cent chrome. The clips used to hold refractory in place are of chrome alloy, thus assuring position of refractory during iis entire life.

The furnaces have refractory rear walls and refractory front walls, both of which are air cooled, as is also the floor of the furnace. An air casing extends from the top of the rear wall down to the floor of the furnace, then under the floor of the furnace forward to the front of the boiler and up over the front of the boiler to the oil burners. A blower forces air into this air casing and thus puts forced draft on the oil burners without the complications of a closed fire room. Due to the generous proportions of the furnace the heat release at full rating will not exceed 40,000 B.t.u. per cubic foot of furnace volume per hour.

In addition to extreme care in the development of highly economic units, consideration of accessibility and other operating requirements has been given. Each superheater and economizer element may be withdrawn individually without disturbing any others. The various controls, soot blower heads, etc. have been arranged for maximum convenience in daily operation. For port work—cargo pumps, etc. desuperheated steam is used and for that reason large desuperheaters are provided in each steam generator. These make available 24,000 pounds of steam per hour at a superheat of 25 degrees Fahrenheit, thereby combining highly efficient propulsion units with effective port boilers for heating and pumping.

Double Reduction Geared Turbines

Westinghouse Propulsion Units for Two Gulf Oil Corporation Tankers Building at Sun Yard

By Harold Anderson

Marine Engineering Department, Westinghouse Electric & Manufacturing Company

The propelling units for the two tankers built by Sun Shipbuilding and Dry Dock Company, of Chester, Pa., for the Gulf Refining Company, were designed and built by the Westinghouse Electric and Manufacturing Company at their South Philadelphia Works. The turbines are of the cross-compound impulse reaction type, driving the propeller through a single case, double reduction gear at a normal speed of 78 revolutions per minute. The turbines are designed to develop 2800 shaft horsepower during normal operating conditions, when supplied with steam having a pressure of 375 pounds gauge and a total temperature of 700 degrees Fahrenheit. The designed vacuum is 28 inches, based on 84-degree injection water. Manually operated nozzle control valves are provided for varying loads and for use should the steam conditions vary from the designed values.

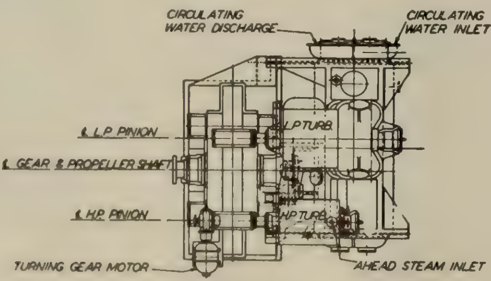
The turbines are mounted on the gear case and the condenser, and no separate foundations are required for these units. The condenser is hung from two heavy I-beam type of supports, which are mounted on the gear case at the aft end and on a separate foundation at the forward end. Consequently, the alignment of the low pressure turbine cylinder, which is bolted solidly to the exhaust opening on the condenser shell, is not influenced by expansion or contraction of the condenser.

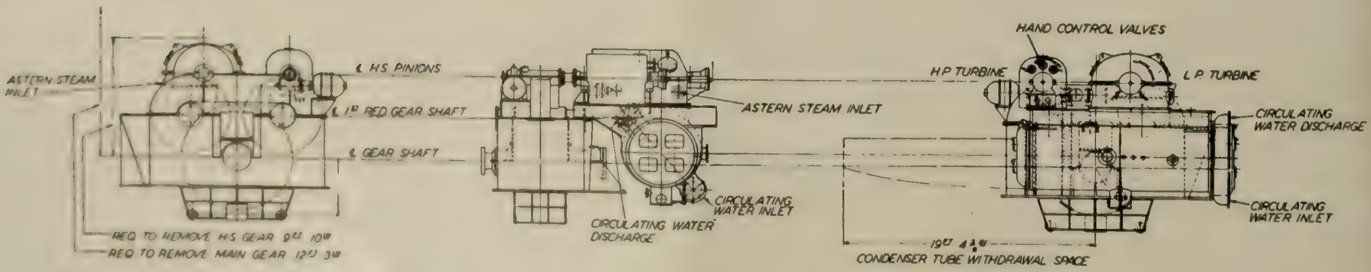
● Turbines

The high pressure turbine consists of a 2-row impulse wheel, followed by twenty-three rows of reaction blading. The low pressure unit has nineteen rows of reaction blading for ahead operation and, in addition, the astern turbine, comprising two 2-row impulse wheels, is mounted inside the exhaust end of this unit.

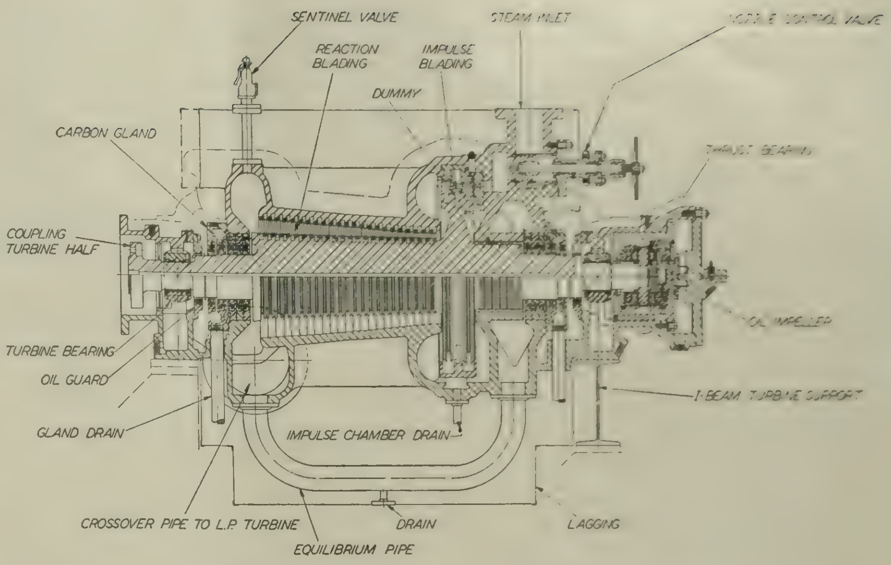
All blading is made from corrosion resisting steel and is of the latest, most efficient design. The blades are held in position by means of modified T-roots, except for the stationary impulse blades and the last stationary row of reaction blades, which use a somewhat different type of fastening. The reaction blades used in the high pressure turbine are comparatively short. To provide an effective seal against tip leakage, shrouding, in conjunction with thin seal strips, is employed to maintain small radial clearance. The shrouding is made in sections from corrosion resisting steel, fitted over tenons on the ends of the blades and arc welded in place. The sealing strips are made from thin strips of corrosion resisting molybdenum steel and are securely fastened by being rolled into grooves. These sealing strips are removable, and can be renewed if the clearance between them and the corresponding blade shrouds should increase too much. The same type of sealing strip is used for the dummy cylinders. This construction has been used in many Westinghouse turbines in recent years, particularly in the high temperature units, and has proved very satisfactory.

The turbine rotors, which are of the solid type, are made from carbon steel. To permit examination of the center of the forging a hole is drilled along the axis of sufficient size to insert an instrument resembling a





General arrangement plan and elevations of turbines, gear case, condenser and turning motor, 2800 horsepower Westinghouse propulsion unit.



Sectional elevation of high pressure cylinder and rotor.

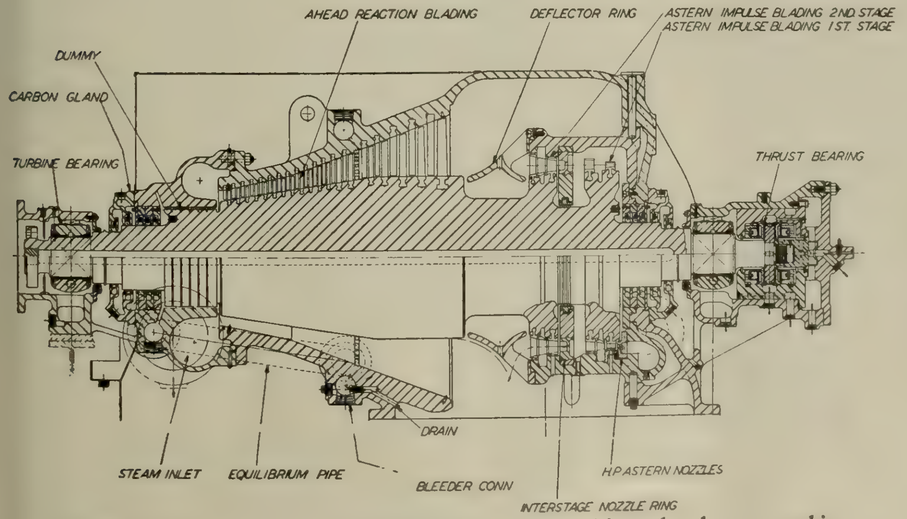
periscope. By means of this instrument a minute examination is made of the walls of the bore, to insure that no flaws are present.

The mechanical arrangement of the two rotors is somewhat similar, there being an overspeed governor impeller and a Kingsbury thrust bearing at the forward end. In the high pressure turbine the dummy is located at the forward end, whereas in the low pressure turbine it is at the aft end.

Where the rotor passes through the cylinder, carbon glands are used to seal against leakage. All these glands are similar in construction, each having five carbon rings, split into segments and held together by means of garter springs.

Consisting of two 2-row impulse wheels separated by a diaphragm, the astern turbine rotor is carried in a separate cast steel cylinder mounted in the exhaust chamber of the low pressure turbine on brackets and radial pins. This construction permits controlled freedom of expansion and contraction, which is extremely important. When consideration is given to the fact that the astern turbine operates in the ahead direction at a temperature of 90 to 100 degrees Fahrenheit, and may at any time be called upon to operate with an inlet temperature of 700 degrees Fahrenheit, and higher momentarily, it is evident that the design of the astern turbine must receive careful consideration. To prevent the exhaust steam of either turbine from impinging on the blading of the other, a deflector ring is bolted to the exhaust end of the astern cylinder.

Thrust bearings, which are used to locate the rotors with reference to the stationary parts, and to carry that part of the steam thrust not balanced by the dummy, are of the standard Kingsbury type. Journal bearings are supported by means of three steel blocks, which are provided with liners to allow for radial adjustment of the rotor axis. Lubricating oil is supplied through a drilled hole in one of the lower blocks and is led to longitudinal grooves cut in both sides of the babbitt at the horizontal centerline. The two longitudinal grooves are connected by means of an annular groove cut in the upper part of the bearing. The babbitt above and below the horizontal joint on each side is relieved to give extra clearance, which further assists the flow of oil into the bearing proper. Distributing grooves and the relieved sections extend to within a short distance of the ends of the bearing. From annular grooves cut in each end of the bearing, the oil is drained through several drilled holes at the bottom, into the bearing housing, thus preventing the oil from spraying against the oil ring.



Sectional elevation of low pressure cylinder and rotor with enclosed astern turbine.

To prevent overspeeding in case of shaft breakage or loss of the propeller, a very simple and effective type of governor is provided. It consists essentially of a centrifugal oil impeller mounted on the forward end of each rotor, which uses oil from the lubricating system as an operating medium. Discharge pressure varies as the square of the impeller speed providing a very positive governing action.

The governing arrangement is combined with the two maneuvering valves and hence no separate governor valve is required, thus reducing the steam pressure drop to a minimum. Steam enters through a steam strainer and passes to the two maneuvering valves located on each side of the strainer in the same casting. These valves are connected to the oil operated governor piston through a system of links, and to independent handwheels for ahead and astern operation. The governor operating piston, mounted below the two valves, is so arranged that it tends to lift against a heavy spring located above the piston when oil from the lubricating system is admitted. A loss of pressure in the lubricating oil system will hence close the valve and shut off steam to the turbines automatically. The governing mechanism consists of an oil relay mounted below the operating piston and actuated by oil from the governor impeller. The governor oil forces a small relay piston downward against a spring, which may be adjusted for small variations in maximum speed. A rod, extending from the top of the relay piston through a reamed hole along the axis of the operating piston, serves to regulate the flow of oil to or from the lower side of the operating piston. When the maximum speed is approached the relay rod moves downward, closing the oil pressure supply to the operating piston and opening ports to release the pressure below the piston, thereby permitting the spring to force the operating piston down and throttle the maneuvering valve, thus preventing the turbines from exceeding a predetermined maximum speed.

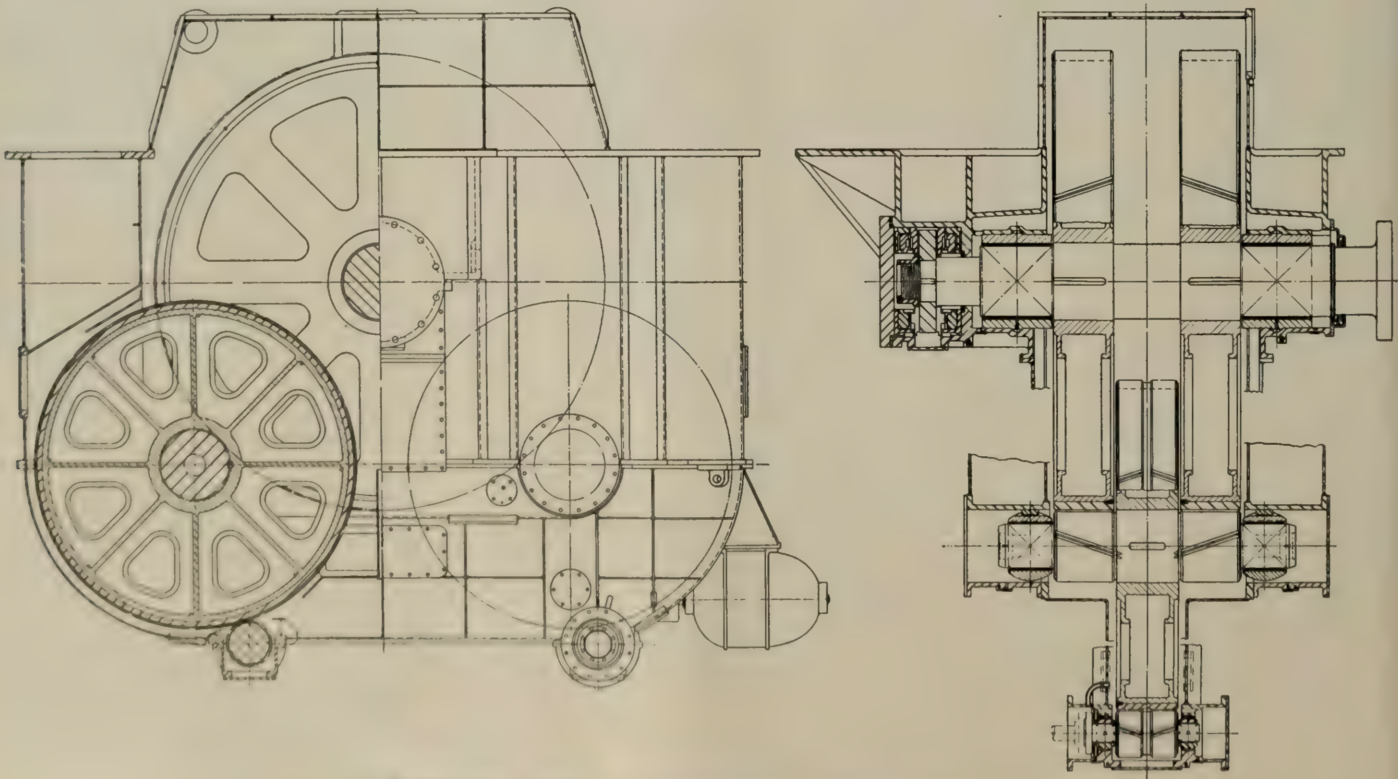
This construction of the governor mechanism has two important advantages. The first is that as the governor piston and the actuating relay use oil for an operating medium and as these parts must move when the valves are used for maneuvering purposes, any danger of the governing apparatus sticking is eliminated. The second advantage is that when operating in a heavy sea, the turbines may tend to overspeed, but the only effect of the governor will be merely to throttle the steam flow and thus keep the turbines running within fairly close limits of speed. It will be obvious that this scheme for overspeed control possesses none of the objectionable features of the conventional mechanical tripping device, which, under similar conditions, may shut down the unit completely.

● Main Reduction Gear

The main reduction gear reduces the speed from 4820 revolutions per minute on the high pressure turbine and 3615 revolutions per minute on the low pressure turbine to 78 revolutions per minute on the propeller shaft at 2800 shaft horsepower, the power being divided approximately equally between the two turbines. The turbines are connected to their respective pinions by means of a drive shaft having a sliding type coupling at each end. The gear housing is of fabricated construction and is provided with openings to permit inspection of any important part of the gear with ease and convenience. All bearings are accessible for inspection, and may be rolled out after removing the bearing caps without disturbing any other part. Each pinion bearing is supported on four pads with adjustable liners, to provide for proper alignment of the rotating parts of the gear. A Kingsbury propeller thrust bearing is mounted on the forward end of the main gear shaft.

All pinions are made from heat treated forged carbon steel, and the gear rims are made from forged carbon steel having a somewhat lower carbon content than the steel used for the pinions. The high speed pinions have a pitch circle diameter of 7.90 inches and 10.53 inches for the high pressure and the low pressure sides respectively, and the high speed gear wheels have a pitch circle diameter of 74.96 inches. The face width of the high speed gears is 12 inches. The corresponding figures for the low speed elements are 16.01 inches and 104.28-inch pitch circle diameter and 27-inch face width.

By mounting the high speed gear wheels on the low speed pinions, between the two helices, the high speed pinions become very short and only two bearings are required for each pinion. The aft end of the high speed pinion driven by the high pressure turbine, has an integral flange which is connected to a motor driven turning gear. A sliding pin type coupling,



Westinghouse double reduction propulsion gearing in single case.

operated by a hand wheel, is used to connect the turning gear to the pinion when in use.

Minimum weight not being of primary importance, the gear wheels are made from cast iron having forged steel rims shrunk on and held in place by securely locked screwed pins.

● Main Condenser

The main condenser, which is of fabricated construction except for the water boxes, is hung between two longitudinal beams. These beams form part of the shell end flanges, and are further stiffened to an I-beam section by plates welded to the upper and lower edges of the beam. Such a design is, of course, practicable only where fabricated construction is used. The upper part of the condenser shell is so designed that it forms two transverse beams merging into the exhaust connection, and the whole structure thus forms an exceedingly rigid support for the forward end of the turbines.

The steam side of the condenser is of the radial flow type, and the cooling water makes two passes through the tubes, the cooling water entering and leaving on the port side. The condenser, which has 4000 square feet of cooling surface, is designed to maintain a vacuum of 28 inches when supplied with 4500 gallons per minute injection water at 84 degrees Fahrenheit and condensing 27,000 pounds an hour exhaust steam. The hotwell has ample capacity and is of the deaerating type. It is specially designed to prevent steam and noncondensable gases in the condenser from entering the condensate pump suction when the level of the condensate is less than at the normal capacity of the pump.

The air ejectors are of the twin, two-stage condensing type, served by motive steam at a pressure of 150 pounds per square inch. The inter and after condensers use condensate only for cooling purposes and no salt water is used. Each set of air ejectors is provided with shut-off valves so that either side may be isolated.

● Tests

At the completion of manufacturing operations, the first unit was erected on the test floor. The turbines, gear and condenser were assembled as a unit, simulating the installation aboard the ship as far as possible, and arrangements were provided to measure the power by means of water brakes. The amount of steam used was determined accurately in weighing tanks. High pressure steam was supplied from a 600-pound boiler, throttled to the desired pressure, and the designed operating temperature was obtained by means of an externally fired superheater.

The tests were highly successful in every way. The unit ran very smoothly and the gear tooth markings, when examined at the conclusion of the trials, were practically perfect. The guaranteed steam rate was comfortably met and the maneuvering qualities, as far as could be judged on the test floor, were excellent. After the trials had been completed, the unit was taken down for a careful inspection and then reassembled for shipment.

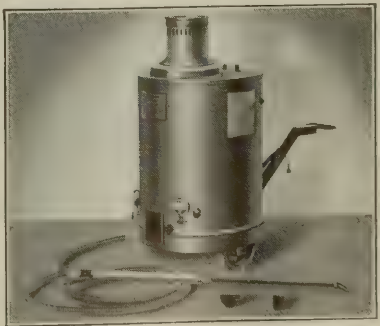
A New Hypressure Jenny

The Homestead Valve Manufacturing Company, who for several years has been manufacturing high pressure vapor spray cleaning equipment under the trade name of Hypressure Jenny, announce their entry into the low-priced cleaning equipment with a new unit.

This new unit, to be known as Model G, is operated on the same principle as previous models. Cleaning is accomplished by means of applying through a nozzle to the surfaces to be cleaned, a combination of water vapor, hot water and cleaning chemicals, over a pressure range from 50 to 150 pounds per square inch.

The unit is fully contained, carrying water, solution and oil tanks, oil burner, vapor generator, water and solution pump, electric motor and a specially constructed vapor hose with a variety of shaped nozzles.

Vapor pressure is developed by means of a vertical-spiral-parallel-coil type vapor generator, and is controlled by an automatic pressure control switch. The vaporizing oil burning system burns a standard kerosene or light furnace oil. Pilot flame is obtained by manual ignition, but is retained automatically after starting.



The portable high pressure jenny.

Both temperature and pressure are held within narrow limits of variation. Safety valve and full nozzle control give the operator absolute command of the spray and eliminate all danger of damage to the generator or operator.

A saturation selector enables the operator to change the spray and have a wetter or dryer vapor as needed to obtain the proper operating effect. Paint thus may be stripped by using very hot water containing a strong alkali; or by adjusting the spray and pressure, tar or very heavy grease may be blasted off.

Efficiency of the equipment has been further increased by the development and use of a single triplex plunger pump equipped with mechanically operated inlet check valves. This pump is so designed that without interruption it handles water, liquids containing chemicals, sticky fluids, gasoline, and oils. In this case, it pumps both the oil to the burner and water to the coils.

Model G Jenny is made in both stationary and portable types. The stationary unit is mounted on a platform with legs which allow it to be raised several inches above the floor, also suitable means are provided for bolting the platform to the floor or other surface on which it is to be set up. The portable unit is mounted on a truck with 10-inch diameter semi-steel roller bearing wheels, $2\frac{1}{2}$ inches wide. Solid rubber - tired wheels are also provided where needed.

Hypressure Jenny requires no boiler inspection or licensed operator.

Recent Products of European Shipyards

One of the most interesting recent developments in Europe is the adoption of the diesel electric drive by the Hamburg-Amerika for the 13,000-ton passenger liner ordered in April. On this ship, there will be six main generators, each driven by a 3000 brake horsepower diesel at 250 revolutions per minute. The same owners also have building a cargo vessel with diesel electric machinery of 6800 brake horsepower. The passenger vessel which will be used in the Hamburg-West Coast of South America service is building at Deutsche Werf. She will be a twin screw job with the following principal characteristics:

L. B. P.	558 feet
Beam molded	73.7 feet
Gross register	13,000 tons
Engine output	18,000 b.h.p.
Sea service speed	17 knots
Passenger capacity:	
First class	150
Tourist	150
Cargo capacity	about 9000 tons

This contract is of especial interest to the Pacific Marine Review, because way back in 1920 we published many articles calling attention to the benefits to be derived from diesel-electric propulsion machinery. With higher speed, lighter weight diesels, and high tension alternating current system of electrical generation, transmission, control, and application, the possible benefits are even greater now than they were then.

Harland & Wolff, about May 1, delivered to McIlwraith, McEacharn, Ltd., of Australia, a beautiful motor passenger and cargo coastwise liner, the Kanimbla. Her principal measurements follow:

L. B. P.	460 feet
Molded beam	66 feet
Molded depth	36 feet
Gross register	10,970 tons
Service speed	17 knots
Engine power	10,000 i.h.p.
Passenger capacity:	
First class	203
Cabin class	200

This vessel is propelled by two Harland and Wolff, B & W, four-stroke single-acting diesel engines of the cross-head type having 8 cylinders each with a diameter of 740 m.m. and stroke of 1500 m.m. At the normal speed of 108 r.p.m. each engine develops 5000 indicated horsepower. The engines are pressure charged from blowers driven by exhaust turbines. After passing through these turbines the gases pass to a Cochrane exhaust gas blower, where they generate steam for heating and culinary purposes. Four 300 k.w. diesel driven generating sets take the electric load.

The first class dining saloon seats 250 and is beautifully panelled throughout in polished hardwoods, flame birch, sycamore, and Australian walnut. First class entrances, music room, port and starboard lounges, smoking room, and suites, are finished in Australian hardwoods and decorated with oil paintings of Australian scenes, painted by Australian artists. Kanimbla's deck spaces boast a fine swimming pool, a glass screen-enclosed dance floor, and two deck tennis courts. She even has a broadcasting station—the first one afloat.

Themortank punkah louvre system is used throughout for ventilation, and a Grinnel sprinkling system is installed throughout the passenger accommodations for fire protection.

This vessel is to be used mainly in the Cairns-Freemantle service. Freemantle, located near the southwest tip of the island continent, is the port for Perth, a city boasting nearly a quarter of a million inhabitants, and the capital of West Australia. Cairns, near the northeast tip of Queensland, and a typical boom city of the more modern Australia, is approximately 3000 miles by sea from Freemantle, and nearly 4000 if the ship pulls into all the principal ports en route. This route does not serve the populous part of Australia, and yet here is an old conservative, Australian steamship firm, of very Scottish antecedents, putting on a beautiful new motorship which is equal or superior to any coastwise vessel anywhere in the world. Our American coastwise operators and our American government might learn something to our mutual advantage if a study were made of this phenomenon.

New Australian motor coastwise passenger and cargo liner Kanimbla, built by Harland & Wolff, for the Freemantle-Cairns service of McIlwraith, McEacharn, Ltd.

The Universal Unaflow Engine

A Modern Reciprocating Steam Prime Mover that is Gaining Favor in Marine Propulsion

Engines designed for uni-directional flow of steam in the cylinder have certain decided thermodynamic advantages over other forms of reciprocating steam engines. Principal among these is the maintenance of the cylinder ends at practically the temperature of the throttle steam, thereby preventing the "initial condensation" which is so wasteful of heat in the ordinary reciprocating engine.

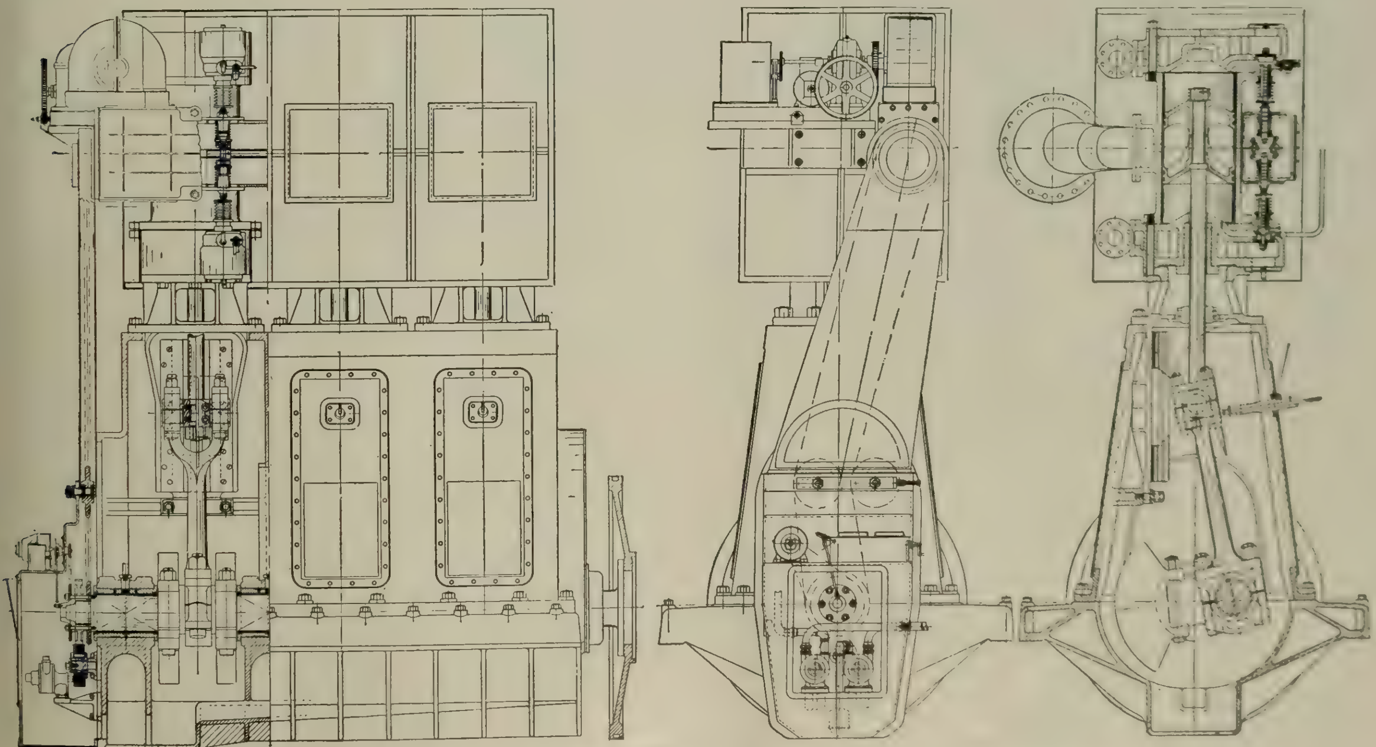
In the uni-directional or Unaflow engine, steam enters at the end of the cylinder through steam jacketed heads and after doing its work on the piston is exhausted through ports arranged around the center of the cylinder and uncovered by the piston at the end of its stroke.

For stationary non-condensing use, in American industries using large quantities of steam for heating and process work, the Unaflow engine has predominated over all other reciprocating types for many years, and the Skinner Engine Company has, during all these years, been its principal exponent in America. When the big world war drive for ships was at its height, the Emergency Fleet Corporation asked this company to undertake the problem of developing a Unaflow steam engine for marine propulsion. Such an engine was designed, was built, and—under the supervision of the Fleet Corporation and other government engineers — was given a very thorough workout and test, including ninety-nine runs for economy test under various conditions of load. The result of these tests showed remarkable economy in steam consumption — economy much greater than would have been possible with the ordinary triple expansion engine under the same conditions of pressure, temperature, and vacuum. Typical results of these tests are shown in the table reproduced herewith.

With approximately 50 degrees more superheat, the figures for pounds of steam per indicated horsepower hour range from 9.24 at one-quarter load to 11.22 at full load.

Shipbuilding and marine engineer-

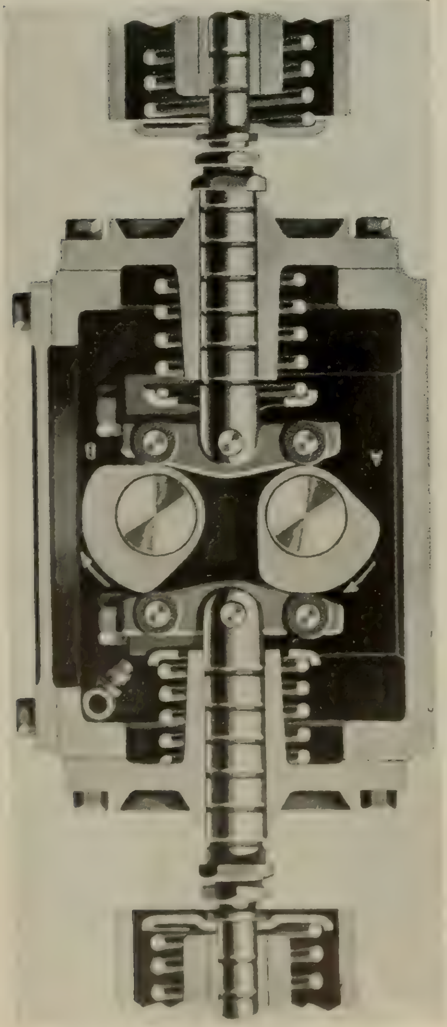
Load, approximate	¼	½	¾	4/4
Steam pressure pounds gage	163	165	161	164
Superheat degrees Fahrenheit	112	107	111	109
Vacuum inches mercury	24.2	24.3	24.2	24.2
Pounds steam per indicated horsepower hour	11.67	11.82	12.10	12.30



Sectional side elevation, end elevation, and transverse section of Skinner vertical universal Unaflow steam engine.

ing were rather dormant in America for some years after the close of the war construction program, but during that period the Skinner Engine Company developed a vertical higher speed, multiple cylinder Unaflow steam engine with poppet valve gear suitable for higher speeds, balanced reciprocating weights and with material and proportions suitable for higher steam pressures and temperatures. The technical staff also designed a valve which remains permanently steam tight for high pressure, high temperature steam. In this connection, they developed a special alloy cast iron, which shows practically no growth or change over a wide range of temperatures up to 800 degrees Fahrenheit. This alloy has a Brinell hardness of 240 in two inch sections, with tensile strength averaging 50,000 pounds per square inch.

In the valve gear, two parallel rotating cam shafts carry duplicate cams at each valve tappet. As is shown in the illustration each of the cams actuates one end of a cross-rider swiveled on the valve tappet. The action of the cams on shaft-A serves to lift the valves and admit steam, while that of the cams on shaft-B serves to close the valves and cut off the steam. Shaft-A is directly geared to the main crank shaft and has a fixed angular relation to that shaft at all times. The angular relation between shaft-B and shaft-A is adjustable, and after being set is controlled by the governor. This adjustment makes possible the control of cut-off over a wide range.



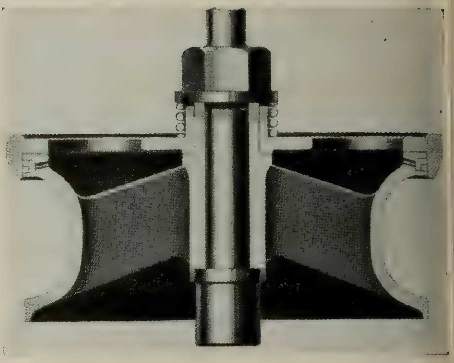
Skinner valve gear.

● Installations Afloat

In 1929, two twin screw tunnel-stern type towboats for Ohio river service were equipped with Skinner Unaflow engines of the vertical marine type. Each of these engines had three simple double-acting 19-inch by 20-inch cylinders, and developed 1000 horsepower at 185 revolutions per minute, using steam at 250 pounds gage, 200 degrees Fahrenheit superheat, and 26 inches of vacuum.

Control of stopping, starting, speed and reversing is almost entirely by adjustment of the cut-off. This arrangement gives full throttle pressure in the cylinder at all loads. The valve gear always can be thrown into a perfect neutral position and the closed valves are always steam tight so that the engine may be stopped with the throttle wide open. These characteristics enabled the application of electric pilot house control on these river tugs. So perfect is this control that the pilot on the bridge can throw either or both of the engines from full ahead to full astern in 3½ seconds. At 200 degrees superheat, and 250 pounds gage these engines required less than 10 pounds of steam per indicated horsepower under standard American Society of Mechanical Engineers weighed condensate tests. In four such tests, the relative steam economy of the engine was 96.4 per cent as compared with the theoretical best possible under same conditions.

This type of engine has a capacity in case of emergency for running at approximately 50 per cent overload which is a very valuable feature for marine work.



The famous Skinner valve.

A twin screw ferry, the Delmarva, built for the Virginia Ferry Company by the Pusey & Jones Corporation and delivered on January 4, 1934, is equipped with two 4-cylinder, 19-inch by 20-inch Skinner Universal Unaflow engines, each normally developing 1500 indicated horsepower at 200 revolutions per minute when operating on steam at 275 pounds throttle pressure and 200 degrees Fahrenheit superheat with vacuum at 26 inches. This ferry has a 26-mile run from Norfolk to Cape Charles and makes four round trips daily.

During her first year in operation she covered 77,000 miles without missing a trip and without an engine adjustment of any kind. At the end of the year she went on dry dock for annual inspection. The only adjustment made on the engines was to remove one 0.005-inch shim from each of the crank boxes. The nickel alloy cylinders were in perfect condition and the tool marks on outer surface of piston rings were still plainly visible.

At the end of her second year she had covered over 150,000 miles and the only adjustment necessary on engines was the removal of another shim from the crosshead boxes. The owners of this vessel were so well satisfied with the showing made that they ordered a duplicate set of engines for a sister ship without taking competitive bids.

In May of this year, the Sun Shipbuilding & Drydock Company delivered to the Erie Railroad Company a large double-end ferry boat, the Meadville, equipped with a five-cylinder 25x24-inch Skinner Universal Unaflow engine rated 2000 indicated horsepower at 135 revolutions per minute with steam at 175 pounds pressure, 100 degrees Fahrenheit superheat, and 26 inches vacuum.

This engine drives a single propeller at each end of the hull through direct connected shafts with a Kingsbury thrust bearing at each end of the bed plate. A heavy forged steel splined coupling is inserted in the shaft line between the crank shaft and the thrust bearing at one end of the engine so as to allow independent adjustment of thrust bearings.

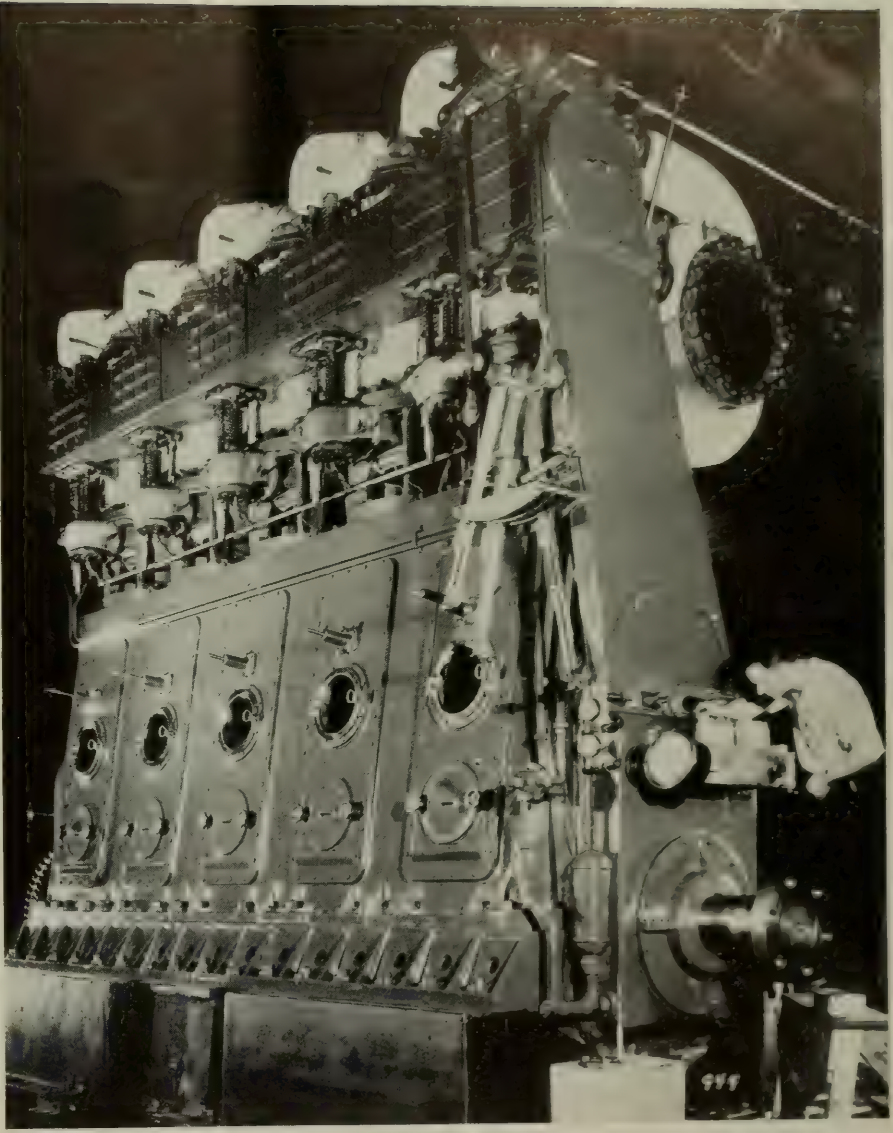
The largest of its type ever applied to marine propulsion, this engine has many attractive characteristics for such service.

Interchangeability is one of its most attractive features. Each cylinder, and each moving part or stationary fitting in connection with each cylinder is an exact duplicate. All duplicate reciprocating parts are, of course, exactly equal in weight, and so with a simple crank arrangement and crank counter weights it is comparatively easy to obtain and maintain perfect balance over a wide range of speed and load.

The very conservative horsepower rating is noteworthy. This is based on 43 pounds mean effective pressure. With the steam conditions maintained on this ship and the cut-off control inherent in this engine it would be a very simple matter to run this engine up to 65 or more pounds mean effective pressure so that it would develop 3000 indicated horsepower at the normal speed. At normal revolutions, the piston speed is very conservative, being only 540 feet per minute.

Force feed lubrication is used throughout on all bearings, cams, rollers, chains, or other wearing surfaces. Cylinder oil in small quantities is fed into each inlet valve by a small sight feed pump. The continuous automatic oiling system includes an oil cooler, an oil strainer, a filter, and a reservoir tank, and is actuated by small steam driven duplex pumps.

With the present trend toward higher pressures and temperatures in steam and higher speed in ships, the Unaflow engine makes a very attractive bid for serious consideration. If we assume 400 to 800 pounds pressure, 700 degrees Fahrenheit total temperature and 28 inches vacuum, the Skinner Unaflow can guarantee steam economies of 7.5 pounds per indicated horsepower hour at light loads and 8 pounds at full load. This high economy at all loads is a very valuable characteristic for the power plant of a high speed ship, particularly when combined with the overload capacity possessed by these engines. Weights as low as 14 pounds per normal brake horsepower for engine and condenser can be safely realized on steam conditions outlined.


Shop view of 5-cylinder Skinner universal Unaflow engine of 2000 I.H.P. as installed in ferry Meadville.

Advantages claimed for the Unaflow Engine in marine propulsion may be summarized as follows:

- High steam economies maintained over long periods;
- Flat steam rate curves with best economy at cruising speeds;
- Simplicity of design and interchangeability;
- Equal power ahead or astern and quick reverse;
- Large overload capacity;
- Low weight; and
- Perfect balance and smooth operation.

Trade Literature

Instruments from the Executive Viewpoint. A beautifully designed and handsomely printed 24-page booklet, setting forth the advantages of accurate instruments to the production manager in a modern manufacturing plant. It is based on the general theme "To measure and control is to economize." A publication of the Brown Instrument Company.

Valve Material Specifications and Standards. Catalog No. 11-A10. The Edward Valve and Manufacturing Company, Inc. Twenty pages of text illustrations, formulae, drawings, and tables, specifically defining various metals and alloys used in valve manufacture and giving dimensions of standard forms.

The Merchant Marine in National Defense

By Commander R. M. Ihrig, U.S.N.

Any discussion of the progress of shipping is bound to be loaded to the Plimsoll mark with statistics, and such must necessarily be the case if we are to investigate the value of our present ships as naval auxiliaries, or to determine the significance of foreign trade in our economic affairs. And so I am going to quote a few figures which will indicate where ships and commerce stand today.

American foreign trade is valued roughly at ten billions of dollars annually, and the percentage carried in American bottoms has risen to 35 per cent, as compared to the 10 per cent carried just before the World War. With the total ocean tonnage of ships over 2,000 tons gross at about 37½ million tons, the United States has 9 million tons as against 18 million tons of England. But 51 per cent of England's tonnage has been built since 1922, whereas only 10 per cent of ours has been built since that year. Hence, in modern tonnage, England outranks us more than ten to one. Of modern cargo vessels built in the last ten years of over 2,000 tons gross, England stands first with 55 per cent of the total, while the United States stands eleventh, or last among the principal shipping powers of the world, with only 1 per cent. In other words, a large portion of the 35 per cent of foreign commerce that is carried in American bottoms is carried in some 200 ships built in the "by-guess and by-God" period of the war, with an annual increase over normal operating costs of some five millions of dollars. In tankers making above 12 knots—and less than that is hardly fit to be classed as suitable for a naval auxiliary—the United States is outranked by England 3 to 1 and by Norway 4 to 1, although the United States produces more oil than both put together. England alone owns about 50 per cent of the tankers of the world, and the United States, producing more oil in one day than Japan uses in an entire year, owns 11 per cent, or about one-ninth of the tankers of the world. And of those we own, only one can make better than 15 knots, which is the speed that would be required for a naval tanker to keep up with a normal cruising formation with the United States Fleet.

This article is extracted from a talk given to a gathering of American School Ships' Alumni at the Army and Navy Club, Fairmont Hotel, San Francisco, January 23, 1936. Those present with their ship and year were:

Captain George Barkley, Nantucket, 1921. Captain D. B. Penick, Saratoga, 1905. Captain H. Blackstone, Saratoga, 1906. Captain G. H. Zeh, Saratoga, 1891. Joseph T. Pugh, Saratoga, 1893. Francis Betts Smith, St. Mary's, 1884. Captain E. P. Bartlett, St. Mary's, 1892. Thomas Herbert, Newport, 1925. E. Bronte, Newport, 1918. Captain M. Crossman, Nantucket, 1925. Captain E. F. Murphy, Ranger, 1914. Arthur O'Leary, Nantucket, 1919. Captain S. H. Johnson, St. Mary's, 1891. E. H. Bradshaw, Newport, 1930. J. M. Fitzsimmons, California State, 1933. J. E. Sterling, California State, 1933. G. J. Pollard, California State, 1935. A. I. Rorharbach, California State, 1935. C. J. Shields, California State, 1933. C. C. Morriss, California State, 1933. Lieutenant Commander Sullivan, Ranger, 1910. Captain F. H. Nelson, Ranger, 1913. Captain David B. Castle, St. Mary's, 1898. Captain R. C. Dwyer, California State. Captain L. N. Edelman, Saratoga-Adams, 1909. Commander R. M. Ihrig, U. S. Naval Academy, 1919. R. M. Smith, Annapolis, 1921. Captain A. Hunter, Saratoga, 1896. H. C. Hoffman, Annapolis, 1929. E. C. Miller, California State, 1934. Captain C. R. Phillips, Saratoga, 1896. M. F. Smith, California State, 1935. J. Tulis, Nantucket, 1931. Captain Felix Reisenberg, St. Mary's, 1896.

We can approach these commercial and shipping statistics from another angle. We can expect that a fair share of imports would be carried in the ships of all nations that ship to us, but our export trade should be carried largely in our own ships. But, in spite of the fact that the United States stands first among the exporting nations of the world, we own only 8 per cent, or about one-twelfth of the ocean-going ships over 2,000 tons gross. And we rank second among the importing nations of the world. Of total world trade the United States promotes 23 per cent, almost one-fourth, which is exceeded only by Great Britain, with 30 per cent. England carries 90 per cent of her own commerce, or 27 per cent of the world's total. We carry 35 per cent of our proportion of the world's trade in our own ships, or about 8 per cent of world's total—less than one-third of Great Britain. True, we have a favorable trade balance, but much of it is wiped out in paying freight rates to foreign shippers. The United States has less ship tonnage in foreign trade than any other maritime nation, figured either in tons per capita or per ton of exports.

What do all these figures mean? They mean that of the 9 billions of dollars spent by Americans for freight and passenger rates from 1921 to 1930, for example, that American ship operators collected only one-third, or 3 billions of dollars, while the balance was paid to foreign ship operators—to subsidize, so to speak, our competitors. They mean that ten million of our people are dependent upon the foreign trade that is our last remaining frontier—the only visible reliance for the future support of the present standard of living of the American people. They mean that nearly one-fifth of all that is produced in this country, either agriculturally or industrially, is exported—20 per cent. How many businesses can show a net profit of 20 per cent, and what will happen to American industry if this 20% is lost? They mean that although over 200,000 men are employed in seagoing American craft and harborcraft; that Japan, for instance, has over 4 million men in seagoing occupations and some 60,000 qualified officers. They mean that although we now have a merchant fleet of some 600 ships, that only 42 of them are now under the postwar shipping laws and only 39 reconditioned, and that the Navy would require not less than 900 ships in any major movement of the American fleet — 50 per cent more ships than we now have.

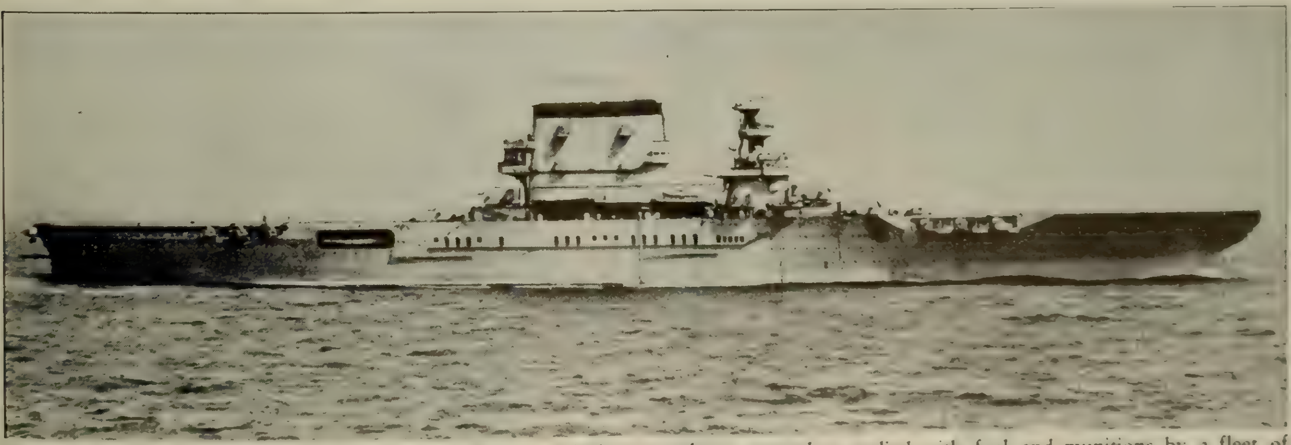
And what, you may ask, can the Navy possibly want with that many ships, and, after all, what can they do with merchant ships? Here is what we will do with merchant ships: We will want auxiliary cruisers that can carry on our commerce without having to be herded by naval escorts. We will want administrative flagships, so that available men-of-war can be put on the fighting line. We will need ships that can be converted quickly into fast aircraft carriers, minelayers, supply ships, tankers and transports. We will need hospital ships, mine-depot ships, ammunition ships, submarine and destroyer and aircraft tenders, refrigerator ships, repair ships, and submarine rescue ships. We will need coastal patrol ships and mine-sweepers. And when it will become necessary to take over these ships, we do not want the merchant marine to be stripped to the point where we will have to depend upon foreign shippers to carry on the commerce without which our economic structure will be crippled.

Is this expecting too much? Is it expecting too much of the wealthiest nation in the world? Is it expecting too much of the nation that created and sent to France three million men in an unbelievably short time? Is it expecting too much of the nation whose genius has enabled them to fly around the world and across both poles? Is it expecting too much of a country that has 7,000 miles of coastline and 15,000 miles of rivers? Is it expecting too much of a country that faces the two principal oceans, and whose total sea-borne commerce on oceans, lakes, and rivers, amounts to 20 billions of dollars annually — many times more than the total cost of its entire Navy? Is it expecting too much of the nation that built the Panama Canal and whose genius created the clipper ships of 1830 and the modern clippers that are spanning the Pacific in five days?

I have mentioned that nine-tenths of the wars of history have had their causes in issues arising directly out of trade. I will go further than that: the world is constantly at war in an economic sense. The world is engaged in an economic war right now of unparalleled intensity and extent. The object of this war is foreign trade, by which nations are beginning to realize they will survive or perish. The heavy artillery of that war is an efficient merchant marine and the naval power to protect it. The navy and the merchant marine can not be left out of the discussions of America facing an unsettled world alone, because all our foreign relations, all our participations in the life of the family of nations, must find expression through traffic on the sea. Ships, commercial and naval, are the sole means of giving effective outlet to America's right, America's duty, to participation in international trade and policies. And those of you who have selected to follow the sea or take your place in the great scheme of America's renaissance in foreign trade, need not fear that you are following a profession that is peculiar and separate from normal participation in American life, because seagoing commerce is again rapidly becoming an indispensable function of the economic structure of the United States. The ship under sail was bequeathed to us as the symbol of that adventurous spirit of man that has manifested itself in all phases of human activity—the courageous setting forth to discover and develop new routes and areas of knowledge, wealth and power.

And I will close with the plea that you take pride in your association with that profession that has been known through all history, and particularly in our own, for its vision, its loyalty, its skill, and its courage.

The California State Nautical School, 215 California St., San Francisco, would be glad to get names and addresses of any America School Ship Alumni residing on the Pacific Coast or making Pacific Coast ports.



Even such mighty dreadnaughts as U.S. Saratoga are of little use unless constantly supplied with fuel and munitions by a fleet of merchant ships.

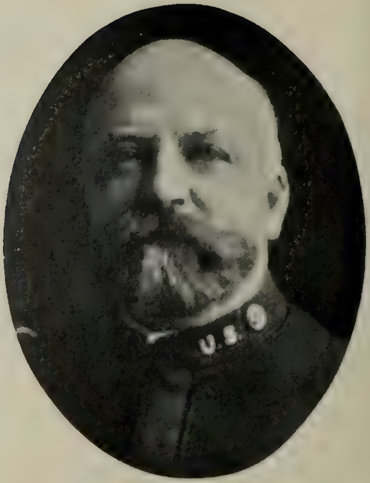
The Coast Survey on the Pacific Coast

Chapter V. *Survey Personalities*

(Continued from May Issue)

By Captain Thomas J. Maher

U. S. Coast and Geodetic Survey



Captain E. F. Dickens.

In all lines of research some of the most important work is done by quiet, unassuming men, who modestly withdraw from the limelight of public recognition. Ferdinand Westdahl was a man of this type. Hydrographer and seaman, he was the equal of the best and excelled by none.

Born in Wisby, Sweden, January 20, 1843, he was educated at the Wisby Elemental Larsouk 1850-1859, and at the Wisby Navigation School 1862-1864.

When the Golden Gate carried supplies to St. Michael, Alaska, for the Western Union Overland Telegraph Expedition, Westdahl was first mate. While on this duty he was transferred to the position of astronomer, with a land party, and spent one or more winters ashore near the Yukon Delta. This was about 1866. When the expedition was abandoned, he turned to work which was in line with his professional qualifications and on November 1, 1867, entered the Coast Survey as Aid. In service on the Schooner Marcy in 1869 he assisted in making surveys of the Columbia River Bar and of Humboldt Bay and approaches. During the following years he was engaged in hydrographic work along all parts of the coast. He assisted Professor Davidson in his great work, "The Pacific Coast Pilot—California, Oregon and Washington," and made many of the sketches shown therein. He had command, at various times, of the largest units operated by the survey—the Steamers McArthur, Gedney, Patterson and Pathfinder. He did valuable work in Alaska and in the Philippines, as well as along the Pacific coast of the United States.

Captain Ferdinand Westdahl.

The survey of San Francisco Bar, made during 1900, while in command of the McArthur, may well serve as a model for hydrographic surveys. Captain Westdahl had the exceedingly rare faculty of being able to make a complete hydrographic survey without having a plotting sheet before him. His work, when plotted later, from recorded angles, would show that the area had been thoroughly covered. His work was not mechanical. He did not depend solely on the sounding lead when making a survey. He observed all changes in appearance of the water—changes in color — rips, riffles, welling up or lumping—kelp whether dead or alive — riffles caused by fish — actions of sea birds, and so forth. He always looked for and investigated these possible indications of shoals or changes in depth.

The great test question of a hydrographic survey is: What dangers were overlooked and found later, by others? Few, if any, dangers have been found later, in areas surveyed by Westdahl. His surveys stand the test. He died at San Francisco, California, on October 25, 1919, aged 76 years.

Larry Westdahl, son of Ferdinand Westdahl, followed in the father's footsteps. He saw Coast Survey service along the Pacific coast, in Alaska, and in the Philippines where he had command of the Coast Survey Steamer Romblon. When Larry left the Coast Survey, it lost an excellent and efficient officer. However, he will admit that he was not as good as his Dad, "The Old Man." Larry is now General Superintendent of the Dollar Line and in his office on Pier 40, San Francisco, California, is a copy of the original survey of San Francisco Bar, made by his Dad.

Captain E. F. Dickins was well known in Alaska, in the Philippines, and in California where he made his home. He entered the Coast Survey on January 16, 1869. During the early years of his services he was engaged on triangulation, on topographic work and in making astronomic observations along the Pacific coast and in Alaska. He was in command of the steamers McArthur and Gedney at different times between 1903 and 1907 and was Director of Coast Surveys at Manila, P. I., from 1908 to 1911. Later he was in charge of the San Francisco office of the Coast Survey. He retired from active duty on January 12, 1920, and on March 2, 1923, at San Francisco, California, passed away in the seventy-seventh year of his age.

The writer saw his first sea service in the Coast Survey under the command of Captain Dickins and the acquaintance then formed ripened in later years into a warm personal friendship. Accuracy, thoroughness and ability as an organizer were his characteristics. In the twenty-nine years which have elapsed since I first served under him on the Gedney, I have yet to see a commanding officer who had a crew better satisfied, had a smaller turnover in personnel, or who turned out a greater amount of work with comparable equipment.

Captain H. W. Rhodes, Superintendent of Lighthouses, Eighteenth District, with offices in San Francisco, California, one of the best known men on the west coast, in shipping circles, has had a very active and interesting career. A graduate from the University of California, he entered the Coast and Geodetic Survey in 1898 and had his first experience in hydrographic surveying on the Steamer Patterson, then operating in Alaskan waters, under the command of one of the ablest of Survey officers, John F. Pratt.

In 1900 he went to the Philippine Islands, at that time in a state of insurrection, as a member of the first Coast Survey party sent there. He was assigned to astronomic work, in the provinces, far from Manila, and traveled continually with a military escort.

He was at Apari at the time of Aguinaldo's surrender. At Batangas, while making star observations at night, he was fired on; bullets pierced the walls of the tent in which he was observing. The marksmanship of the insurrectos was good and he was very fortunate in escaping unharmed.

After completing a survey of the southern part of Culion Island, now a leper colony, he returned to Manila, in the Steamer Research, which he commanded. He entered Manila Harbor late at night, but in the bright moonlight was able to see flags flying from all the vessels in the harbor. These he distinguished as quarantine flags. Cholera was raging. On the following morning he found that he had anchored only a couple of hundred feet from a barge to which floaters were secured. These were unreported dead men set adrift by relatives so as to keep information from the authorities and thereby avoid the restrictions of the quarantine. Dr. Perry, then in the Islands, but later well known in the Public Health Service in San Francisco, came alongside and gave him instructions.

Captain H. W. Rhodes.

In 1902 he returned to the United States. He was assigned to duty on the Atlantic and Gulf coasts and in 1903 went to Alaska. From that time until 1912 he was engaged in surveying Alaskan and Hawaiian Island waters. He had command at different times of the Steamers McArthur, Explorer and Patterson. His last work in the Coast Survey was a survey of the Pacific approaches to the Panama Canal, using for that purpose the Steamer Patterson of which he was then in command.

He arranged for a transfer to the Lighthouse Service and has since been in charge of the California district of that bureau. His district covers about 800 miles of coast line. He operates three lightships and three tenders as well as the greatest number of first-order lights of any district. His office directed the development of airports, the establishment of ranges and beacons, and the lighting of about 2,000 miles of airways.

Probably every master, at some time or other, has thought of modifying his sextant or inventing a new one, so that he could take two angles at once, and also extend its range so as to be able to take angles as great as 180 degrees. During the early seventies, inventive genius along that line manifested itself in the Coast Survey. Commander Johnson, U.S.N., commanding the Hassler, conceived the idea of a sextant with a detachable vernier. When the first angle was taken, the vernier was clamped to the arc, but released from the arm. A second angle could then be immediately taken and the arm clamped in position. The vernier could then be read, giving the first angle. It could then be released and slid along against a stop on the index arm, when it would be in position for reading the second angle. Mr. Lowry, a young officer in the Coast Survey, planned a sextant which would take two angles. It had an arc of 120 degrees, two movable arms and three mirrors. The horizon mirror was placed on the center of the arc. The graduation read both ways from the zero point on the center of the arc. For taking angles greater than 120 degrees, he proposed a sextant having the index glass with reflecting surfaces on both sides. This instrument required a second horizon glass. Every few years these devices are reinvented by enterprising young officers, and by mentioning them here, I thought that I might save someone the trouble of doing the same thing. However, an instrument was developed by Professor Davidson, about this time or a little later, the forerunner of one of the most important instruments in aerial navigation—a bubble sextant. Mr. Adolph Lietz, of The A. Lietz Company, instrument makers, San Francisco, California, informed me that, over fifty years ago, his father manufactured a bubble sextant invented by Professor Davidson.

In this series of short articles only a very limited part of the work of the Coast Survey has been touched. Only a very few of the many who have helped to build the service have been mentioned. No reference has even been made to those who have directed and saved the service when it has been threatened with destruction. I selected the names of a few men, representative of the field force of the Coast Survey; men who cherished the esteem of mariners and whose one great object was to contribute their mite toward reducing the hazards of navigation.

Pacific—International Trade

Occasionally we receive postals from friends traveling in far corners of the earth—postals that set our minds wandering and our feet itching—pictures that make us wonder why we should sit here month after month just getting out one issue after another. Such a card came recently from our good friend, Arthur M. Tode, post marked Magellanes, Chile, and decorated with the beautiful photograph of Puerto Varas, reproduced herewith. Puerto Varas, one of the most interesting Chilean summer resorts in the lake country of southern Chile, is located on beautiful Lake Llanquihue. The town was founded by German agricultural settlers and is a port and clearing house for the products of a large region.

Mr. Tode will be remembered by many readers of Pacific Marine Review as the former national president of the Propeller Club of the United States. His post card message, dated March 31, reads—"Regards to you from Magellanes, the world's most southern city in Lat. 53 degrees S. Had a splendid voyage of a thousand miles through the great Chilean archipelago. Best wishes."

Which is as good an introduction to comments on Pacific International Trade as any, since Arthur Tode is a right hearty ambassador of American commercial good will wherever he may chance to wander.

Magellanes, midway between the Atlantic and the Pacific, on the Straits of Magellan, is at one extreme of the Pacific Trade Basin. This port, the old Punta Arenas, (Sandy Point) of pre-war days, is, itself, an interesting and thriving city of some 30,000 souls. Founded in 1851 by the Chilean government as a penal settlement, it is located on the east side of Brunswick peninsula, opposite the Broad Reach of Magellan Straits.

In 1875, the population of this port was only 950. The country back of the settlement was well-wooded, and coal of inferior quality and in considerable quantity was easily mined nearby. Cattle and sheep raising was introduced on the mainland, on Tierra del Fuego, and on other islands.

Puerto Varas, an important lake port of southern Chile.

After the settlement of the Chilean-Argentine boundary dispute in 1881, Chile formed her part of this southern Patagonian region into Territorio Magellanes, and Punta Arenas became the capital and principal city of the territory, taking the name Magellanes then, so far as Chile was concerned, although remaining Punta Arenas to the shipping world until well after the opening of the 20th century.

Scotch sheep raising interests became aware of the advantages of this region for heavy mutton and wool crops, and for some years now Territorio Magellanes has enjoyed a very thriving business in the production and shipping of these products. The development of this sheep industry on the "land of fire" is one of the remarkable business romances of the present century.

Chile is experiencing a rather favorable reaction to present conditions. The production and sales of nitrate are practically equal, being estimated for 1935-36 as approximately 1,200,000 metric tons. The export price is firm at a fairly satisfactory level. On July 18, 1935, a 3-year agreement was signed with Eureopean producers of synthetic nitrates. This contract defined percentage sales quotas for the entire world with the exception of the United States, and assured to Chile the prevailing rate of nitrate production. Other favorable factors are the firm prices of copper and the very good harvests in agricultural products.

One natural result of these favorable conditions is the increased demand for automobiles and trucks. Imports of motor vehicles which has doubled in 1935 as compared with 1934 are still on the increase.

Peru's petroleum production continues to expand. Her wells gave out 17,066,482 barrels in 1935 as compared with 16,314,380 barrels in 1934. Between 55 and 50 per cent of this production is exported. Peruvian refinery products, chiefly for local consumption, also registered an increase. The opening of the new Central Highway has given a considerable boost to the use of the motor vehicle.

Build Safety into New Ships

Corrections to Code Published in May

In our May issue, pages 163 et sec, we published a tentative, unapproved code entitled "Proposed Minimum Standards for Safe Working Equipment, Gear and Places in New Ship Construction" as formulated by a committee of marine engineers, naval architects, and safety engineers appointed by the Pacific Coast Marine Association's Executive Safety Committee. This code has now, as of May 6, been revised by the Executive Safety Committee and issued by them in mimeograph form for criticism and comment. The changes made by the Executive Committee are for the most part additions to the tentative code as published last month.

We are glad to publish herewith these changes, so that—by reference to the code as published in the May issue—the interested reader may interpolate them under their respective captions and numbers in the code, and get the complete picture of present status of the proposed standards:

● General: page 163:

Rule 2 now reads — "Reference is hereby made to the American Bureau of Shipping's 'Rules for Building and Classifying Steel Vessels'. It is recognized that all requirements of the society or societies in which the vessel is classed must, if conflicting, necessarily supersede any standards recommended herein."

This rule is interpolated between 1 and 2 as given in the original version. The original Rule 2 is now numbered Rule 3, and stands as given except for the last phrase which has been changed to read—"originally adopted by reference, is now included herein under appropriate sections."

Numbers 3 to 6 as given in the original are now numbered 4 to 7.

● Deck Fittings and Machinery—page 163:

No change has been made in Rule 100. Rule 101 reads as in the former version except the last sentence where reference is made to "steel bars" now has the addition "steel bars or wooden battens, at least 3 inches by 3 inches".

Much publicity has recently been given to the necessity for making American vessels more safe at sea. The great majority of this material as it appears in the daily press seems mainly concerned with the production of a non-sinkable ship, and with the measures for getting the passengers off such a ship into lifeboats, when, if, and as she is about to sink. These considerations are very important, and should not be neglected, but in all investigations of disasters or near disasters to ships at sea, we find that the results generally point to the overwhelming value of discipline, training, and morale in ships' officers and crews.

The committee that framed this code of standards for building safe working conditions into new ships feels that the adoption of the rules herein set forth will contribute greatly not only to minimize accidents to the crew, but also to enhance crew morale and efficiency in all times of emergency, and so produce a higher standard of safety for transportation by sea under the American flag.

Rule 102 and Rule 103 stand as given. Former numbers 104 to 107 inclusive have been changed to 109 to 112 inclusive, and five new rules have been added following original 102. They read as follows:

Rule 104: When vessels are constructed for a trade which generally requires the carrying of deck loads, (a) winches should be located upon platforms elevated to at least the height of the maximum deck load allowable or (b) elevated platforms for winch drivers should be provided, and all control levers and the stem of the valve in the steam line should be properly extended to this platform.

Rule 105: There should be a sufficient clear spacing between winches and hatch coamings to allow men free access to hatch ladders.

Rule 106: All exhaust steam from winches should be led back to condenser or funnel.

Rule 107: Winches shall be so constructed that the fall may be wound so that the lever shall have the same direction of operation as the load being handled.

Rule 108: All winches operating with a single lever shall be counterbalanced by a weight properly secured.

A new rule (No. 113) has been added to complete this section, as follows: "An alemite or similar high pressure greasing system shall be provided for greasing cargo boom goosenecks; roller chocks; fair leads, blocks; hatch rollers; and similar equipment."

● Rigging—page 164:

Rule 201, which formerly began, "Neither welded links, padeyes nor eyebolts," etc. has been changed to read "Only forged links, padeyes or eyebolts." etc.

Four new rules have been added to this section as follows:

208—Wooden booms and topmasts shall not be used.

209—Cargo booms shall be as long as practicable so as to avoid excessive strains on booms, guys, falls, etc.

210—All places where wire topping lifts of cargo booms are made fast, such as masts, samson posts, etc., should be provided with two cleats or equivalent, at least three feet apart for this purpose.

211—Lead blocks at the heel of cargo boom should be adjustable to prevent block from sagging.

Note: See also American Marine Standards' Approvals, No. 26 (June 10, 1927) and No. 50 (February 8,

1929) for Tubular Steel — Cargo Beams for Ships and Fittings for Same.

● **Life Boat Arrangement—page 164:**

Rule 300 has been amended to read —"Life boat handling gear on ships carrying passengers," etc.

There are no changes in the sections on Handling Gear (page 164), Manholes (page 164), or trunks (page 164); the next change appearing under Hatch Coverings (page 165), where the original rule has been dropped entirely, and the following new rules given:

● **Hatch Coverings:**

700. Wooden hatch covers shall be considered satisfactory on account of the present cost of steel coverings and lack of any satisfactory metal covers.

701. Hatch covers for all hatches in any one hatchway shall be interchangeable with a standard width according to width of hatch; hence for any one hatchway the beams shall be equally spaced.

702. When hatch covers are made of two boards, these shall be fastened by tie-rods riveted to prevent spreading. Hatch hand-holds shall be independent of the tie-rods and shall be placed far enough from the end so as not to weaken the board, but such distance shall not exceed 12 inches. The hand-grips shall be set off-center and the hole be large enough to freely admit the hand.

703. Hatch beams or strongbacks shall be equipped with sliding bolts (with a positive locking device) horizontally parallel to them, or equivalent, so that beams may be secured to coamings when hatch is being worked in sections.

704. Hatch beams or strongbacks shall have a flange of width of at least four inches for supporting the hatch covers.

705. For any one hatchway the beams shall be equally spaced.

706. Hatch coamings on main or top decks should extend at least three feet above the deck.

707. 'Tween deck hatch coamings should be as low as classification requirements permit.

708. All hatch coamings shall have a flange width of at least four inches for supporting the hatch covers.

709. 'Tween deck hatch coamings should be equipped with sockets and stanchions so that safety lines may be stretched around hatch openings while or when hatch covers are off and no cargo is being worked.

● **Ladders—page 165:**

Rule 800 now reads:

"The following definition shall govern in distinguishing a ladder from a stairway:

"A ladder is an appliance designed for use in ascending or descending at an angle exceeding 50 degrees, with the horizontal, usually consisting of two side pieces called 'side rails', joined at short intervals by cross-pieces called steps."

There are no changes in Rules 801 to 805, inclusive. In Rule 806 we find the following wording for the first line—"Ladders, which lead through manholes".

The original versions of Rules 807 through 811, have been taken out, and in their place the following inserted:

807. Hold ladders should lead through manholes in the deck at diametrically opposite corners of the hatch and shall consist of a steel plate bent in the form of a channel with rungs consisting of flat steel bars not less than 1½ inches wide by ½ inch thick by 14 inches long welded onto the toe of the web, and the ladder shall be so located that the rungs are on the side away from the hatch and shall be continuous and vertical from top of coaming to bottom of hold.

808. Where the foregoing rule is not desirable, access to holds through hatches in all ships carrying general cargo shall be by means of ladders permanently placed and secured in the open hatchway and straight, vertical and continuous from top of coaming to bottom of hold. Each hatch in excess of 15 feet in length shall be equipped with two ladders on opposite sides or ends of hatchways. Ladders shall be constructed as follows: "Side runners to be 3 inches by 6 inches angle iron with the rungs fastened near the edge of the 6 inch leg of the angle and the 3 inch legs to be turned in behind the ladder to prevent cargo crowding too close to rungs; and that rungs be of flat steel bars not less than 1½ inches wide by ½ inch thick and not less than 14 inches long."

809. When ladders terminate upon the shaft tunnel, short ladders of standard construction shall extend from the top of the shaft tunnel to the bottom of the hold.

810. (a) Where a hatch is trunked two steel ladders of the above standard construction shall be placed in diagonally opposite corners and shall be enclosed in steel trunks of lattice construction. The sides of these lattice enclosures should be approximately 2 feet by 2 feet 3 inches and they should extend from the top to the bottom of the trunked portion; suitable vertical angles should be fitted at the corners with ½ inch by 3 inch horizontal bars, spaced about 2 feet apart and riveted to the corner angles; extra wide bars should be fitted at the upper and lower ends of the enclosure to give vertical strength. The two open sides of the lattice enclosure should be covered with ½ inch by 2½ inch steel bars fitted vertically and spaced about 6 inch centers.

(b) From the bottom of the hatch trunk to the tank top in way of lower hold the ladder is to be of standard construction and may be bolted in position for easy removal. This portion of the ladder is to be guarded on one side by a similar steel lattice, which will be removable.

811. Access to each hold specially constructed for bulk cargo, unless furnished with ladders of types (a) or (b) above, shall be through 14 inch by 18 inch man-holes on each side of the hatch and through each deck from the weather deck to the lower deck and shall be straight, vertical and continuous and fitting a steel trunk approximately 24 inches square around the man-holes and carried from deck to deck. This trunk is to be enclosed on three sides but will be left open on the hatch side; to be made of ¼ inch plate with 2½ inch by 2½ inch by 5/16 inch corner angles, upper and lower ends to be riveted to deck with suitable angles. A steel ladder of the above standard construction is to be secured to outboard wall of each trunk as shown. The man-holes on each deck are to be fitted with a raised steel coaming riveted to deck and made water-tight and provided with a hinge steel cover or door which will have a heavy eye and hasp for padlock, and in addition, the man-hole doors on weather deck are to be provided with rubber gasket and suitable dogs for water-tightness.

Rules 808 to 811, inclusive in the

original version are numbered 812 to 815 in the corrected copy; and a new Rule 816 is added as follows: All ladders other than vertical should lead fore and aft.

● **Stairways—page 165:**

The only change under this subhead is the addition of the words "and should lead fore and aft" at the end of Rule 900.

● **Railings—page 165:**

Rule 1002 now reads: Hand rails shall be installed completely around moving parts of machinery which is not of the enclosed type.

● **Jack Rods—page 165:** No change.

● **Chain Lockers — page 165:** No change.

● **Illumination—page 165:**

Rule 1300—The words "or with the following" have been interpolated before the phrase which begins "whichever standard provides," etc. Rules 1302 and 1303 have become Rules 1309 and 1310 in the revised copy, while Rules 1301, 1304 and 1305 in the original, have become subheads d, e, and f under Rule 1313 in the new version; while new rules 1301 to 1313 (with subheads a, b, and c) have been added as follows:

1301. For Hold and 'Tween Deck Lighting portable units of a type equivalent to the portable light, described later, should be used; outlets for plugging in the portable units are to be provided in each end of the coamings at all 'tween decks.

1302. For Side Port 'Tween Decks a combination of permanent and portable fixtures should be installed. The permanent fixtures should be so spaced overhead as to avoid shadows and each bulb should be not less than 100 watt capacity inside-frosted globe in suitable reflector of the R. L. M. dome or angle type. These should be supplemented in special working places and near side port entrances by portable lights.

1303. For Deck Lighting permanent fixtures should be placed on samson posts and masts with proper reflectors to illuminate all deck cargo-handling machinery and gear, and all deck spaces between hatch coaming and the rail over which the cargo hook is passed.

1304. For Gear Aloft it is recommended that either lights of a portable type with proper reflectors or floodlights be so placed on the starboard and port sides of the housing, both forward and aft, to illuminate all blocks, shackles, falls, topping-lifts, and other gear which is being used in cargo-handling operations. It is particularly important that all gear at the end of the booms should be visible to the winch driver.

1305. The recommended minimum standard portable light consists of a standard Benjamin type (No. 5543) commercial reflector, fitted with a special shock-absorbing lamp socket, and mounted upon a special ball and socket bracket which permits the light to be directed and held in any desired direction with a minimum of effort. The bracket is built to fit in an inexpensive cast steel socket of about 4 inches by 4 inches over all dimensions, capable of being riveted, welded or otherwise permanently or temporarily secured to hatch, ladders, coamings, beams, stanchions, rails, or similar places. The ball and socket tension is automatic which, when the bracket is placed in a socket makes it possible to turn the light in any direction or plane by use of one hand only. The reflector is of the symmetrical angle type, 12 inches in diameter, having a spread of approximately 65 degrees. The bulb used is of the Mogul type, which will not fit ordinary electric lighting sockets. The entire assembly is light and easily carried and/or set in bracket socket with one hand. It is so constructed that it will withstand rough handling.

1306. Two portable cargo lights, the equivalent of the foregoing, should be provided for each hatchway and a sufficient number of bracket sockets should be placed in convenient places at the hatch coamings and other convenient places in each 'tween deck. In order to minimize glare it is recommended that white bowl lamps be used; only lamp units of 300 watt capacity be used and that, the reflectors be maintained in a clean and polished condition.

1307. The permanent fixtures recommended for samson posts and masts should be of the types that are now commonly used aboard ships except that all lamps should be from 300 to 500 watt capacity fitted with special shock-absorbing socket. They shall be fitted with suitable guards and a reflector of the R. L. M. dome or angle types or equivalent, the shape of the reflector depending on the positions of the samson posts or masts with relation to the area to be illuminated.

1308. Where lighting equipment may be exposed to the weather or to an accumulation of explosive vapor that may escape or be released from cargo, it is of utmost importance that vapor proof equipment be installed.

1311. It is recommended that a light cream be adopted as a standard color for painting the holds of ships and other surfaces where reflecting of light is required.

1312. Individual lights should be installed in each berth (crew's quarters, passengers and officers accommodations).

1313. Light intensity is expressed in foot-candles. One foot-candle is the intensity of illumination produced at a point on a surface, one foot distant from the light source of one candle power, the surface being at right angles to the light rays. The following minimum standards for illumination intensity should govern:

(a) For decks and holds the minimum intensity of illumination should be two foot-candles.

(b) For gear aloft, the minimum intensity of illumination should be one-half foot-candle.

(c) For 'tween decks worked through side ports, the minimum intensity of illumination should be three foot-candles.

Except for one other change the remainder of the rules remain as in the original draft. This change occurs under the heading "Electric Systems" on page 175. In addition to Rule 2500, which remains as first written, the following has been added:

1501. Switches and fuses shall be located in safely and readily accessible locations where the switch handle or the fuses will not be more than 6½ feet above the floor, deck or permanent platform.

2502. Switches and fuses shall not be located where explosive gases, vapors or dust may be present in dangerous quantities except as provided in Rule 2503.

2503. Switches and cutouts having all parts, which may arc or spark, submerged in oil, may be used in places where explosive gases or vapors are present, if it is impracticable to locate them elswhere. Such equipment should not be permitted except where the equipment will be under competent maintenance and supervision.

When and What is an Accident

By D. A. Bary

Engineer, Industrial Accident Commission of California

It is a curious and regrettable thing that there should be so widespread a misunderstanding of the meaning of the word "accident." Not only among the general public, who may well be excused for inexactness; but among men who are more or less definitely connected with accident prevention, there is a tendency to define an accident as an occurrence which causes a personal injury.

An accident is a happening without design. It may work an injury on an individual. It may bestow a benefit on him. It may harm one and operate to the advantage of another. In an honestly conducted lottery, for example, the selection of the winners is pure accident, yet obviously, these are benefited at the expense of all other ticket holders.

Why, then, should we desire to prevent accidents? For the very reason that they do occur without design. To conduct a life, or a business, to the best advantage, one must have a plan. The better the plan, the more likely is one to succeed, provided that one adheres to the plan. Any departure from the plan lessens the chance of success; and the better the plan, the more thought that has been put into it, the greater will be the damage done by interruptions. The essence of efficiency is a good design rigidly followed.

Even so simple a matter as eating soup involves a plan. First the spoon is introduced into the soup. Then it is raised above the surface, levelled and conveyed to the mouth. At the proper moment the mouth is opened, the spoon placed in the correct position for discharge and tilted. When the load has been discharged, the spoon is again levelled and carried back to the plate. All this may seem very complicated as a description of a simple, everyday operation, which we think we do instinctively, but in reality it is only the skeleton of a complete analysis. Note how many opportunities are present for departing from the plan. For evidence that these departures do occur, we have only to consider the ties that are discarded, the waistcoats cleaned, the tablecloths laundered.

When we come to involved industrial operations, the chances for accident increase enormously. Because this is realized, planning and supervision are most carefully done, and we reach the paradoxical situation that the more complicated and hazardous the work, the greater is the probability that it will be carried out without accident. When executives, comprehending the full difficulties of a task, set out to surmount them, they usually succeed. Far too many accidents happen because someone in authority considers a bit of work too trivial for his attention. The job that any fool can do is entrusted to just that sort of person, and then it develops that after all it was not quite so simple as it appeared. The result is that a task put into the hands of an incompetent is neither well planned nor well executed.

Because of the failure to comprehend the true nature of an accident, it is too often the case that only accidents resulting in personal injury or in serious property damage are brought to the attention of the management. If a truck is upset and the load spilled, without damage, the load is replaced and carried to its destination and nothing is heard of it. A real executive, if he knew about the matter, would realize that something should be done. A repetition might cause an injury, or damage material, and in any case, the cost of handling has been increased. So he would seek the cause, which might be a bad spot in the floor, a defective truck, an obstruction left in a gangway, and eliminate it, realizing that accidents like snakes, often rattle before they strike. But the man on the job, uninstructed, pays no attention to the occurrence, and so it is permitted to happen again, and again, until the inevitable serious result takes place. We have learned that the smallest injury may, if neglected, lead to dangerous infection. It is time that we learned that the smallest accident, if disregarded may lead to a calamity.

The common use of the expression, "near accident," is another indication of the same loose way of thinking. There is no such thing as a "near accident." It happens, or it does not happen. What is meant by the expression, is an accident that might have had serious consequences but did not? Let us consider the following hypothetical case: A mason dropped a brick from the fifth floor of a building under construction. He had no intention of dropping the brick—it slipped from his hand. The brick fell to the ground and landed in a heap of sand. The mason, watching the course of the speeding brick, sighed with relief and remarked, "Pretty lucky."

Had the brick struck a fellow workman, the occurrence would have been an industrial accident. Had it struck a passerby, the affair might have led to a civil suit. As it was, it would probably be called a near acci-

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dent. Wrong. The brick fell without design, therefore, the occurrence comes clearly under the definition of an accident. Supposing a little further, that the brick did strike some person and inflict an injury so that the event must be termed an accident by any definition, where did the accident occur? On the ground, where the man was injured? Certainly not. The injury was suffered there, but the accident took place on the fifth floor, where the brick started, and furthermore, it was all over as soon as the mason had lost his grip. If the fall had stopped at the scaffold, still an accident would have occurred.

This may seem far-fetched, but a few years ago four supposedly competent investigators went to a plant where a crane cab fell from its track and carried the operator thirty feet to the ground, killing him instantly. Each of these men made a report of his findings, and not one went up to the track to learn why the crane had run off. Not until a fifth man found that the safety stop had been disconnected was the cause discovered.

Anyone who thinks he can prevent accidents without knowing why they happen is an optimist. And anyone who permits an accident to pass unnoticed, merely because no damage was done, is laying the foundation for trouble. No deviation from plan, whether caused by material failure, lack of instruction, or disobedience, is too small to be investigated. Can any plan be determined a success or a failure unless all variations are eliminated?

—California Safety News

Towing Orders by Phone

The beginning of experimental tests, looking toward the establishing of a radio service by which the operations of towboats may be directed from the offices of the owners is announced by the Radiomarine Corporation of America.

The radio company has equipped the towboat Alice M. Moran, of the Moran Towing and Transportation Company, with a special receiver for the reception of voice messages from a transmitter located in the RCA marine equipment laboratory at 75 Varick Street, New York City. Preliminary tests have already demonstrated that such a service would be entirely successful, the tug having had uniformly good reception of signals at such widely separated points as Perth Amboy, N. J., and Yonkers and Whitestone, N. Y. Even the East River bridges do not interfere with continuous communication as the towboat makes her appointed schedules in New York waters.

Commenting on the tests, Edmond Moran, vice-president of the Towing Company, said: "It is obvious that if owners can be in ready communication with their towboats at all hours of the day and night, regardless of how remote they may be from the office, much time and fuel might be saved in routing the boats from job to job."

The tests are being conducted on a wavelength of about eleven meters. This is at the "long" end of the ultra-short wave band. The receiver is adapted specially to this service, and incorporates fixed tuning and automatic noise suppression, which makes it virtually silent in operation until it picks up the carrier wave from the shore transmitter. The receiver is installed in the pilot house, and operated from a six-volt storage battery.

Reliable Riggers Rules

The matter of safe working loads for ropes used in lifting weights is a frequent matter of discussion afloat or ashore. The wise rigger thoroughly inspects the rope to see that it has no abraded surfaces or broken strands, and then applies some simple formula that he has learned to arrive at its safe load. Or conversely, knowing the load he has to handle, he applies the formula in reverse to get his rope size and then, by inspection, picks a good rope of that size or larger.

A recent issue of Tanker Topics carries a very practical easily memorized group of formulas for figuring the safe working load in tons of various ropes:

If D equals diameter of rope—
Common hemp rope: $1/3 \times D^2$.
Iron wire rope: $8/3 \times D^2$.
Steel wire rope: $14/3 \times D^2$.

Close link wrought iron chain: $6 \times D^2$ where D equals diameter of iron on one side of link.

Example: What weight will a ½-

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inch diameter hemp rope safely stand? One-half squared equals one-quarter. One-third of one-quarter equals one-twelfth. One-twelfth of a ton (2000 pounds) equals 166 pounds. This of course is not the breaking load, but the **safe working** load.

Anyone who will memorize and apply these simple formulas will have no trouble with accidents due to overloading of running or standing rope gear.

Marine Insurance Notes

Morro Castle Claims. In the litigation growing out of the loss of the Morro Castle and the Mohawk, there were some 600 claims aggregating nearly $13,000,000 filed against the Ward Line, owner of the ships.

It will be remembered that the Morro Castle burned at sea on September 8, 1934, with loss of 134 lives, and that the Mohawk was in collision with a Norwegian freighter and sank on January 24, 1935, with 45 lives lost. Three officers of the Morro Castle were recently convicted of criminal negligence and given jail sentences. The decision in the final investigation of the Mohawk collision is still pending.

Against these claims the Ward Line at first set up a petition for

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GEO. E. BILLINGS CO.
308-12 CALIFORNIA STREET, SAN FRANCISCO GArfield 3646
INSURANCE
BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

limitation of liability to the value of the vessels plus prepaid passage and freight money. If granted, this would have made the technical liability of the owners a small fraction of one per cent of the claims. This is satisfactory to the committee and a long adjournment of the case has now been taken to allow time for the committee to get final acceptance from the various claimants. Final hearings on the case will be held some time in October, next.

Shipping Casualties. The Liverpool Underwriters Association's annual summary of casualties shows that during 1935 there were reported as totally lost 111 vessels, each of 500 gross tons or over, and aggregating 265,463 gross tons. One hundred of these ships with a total gross of 243,379 tons were steamers, and the balance motor ships. Of British losses in this class of vessel, there was a total of 78,186 gross tons, comprising 23 steamers and three motor ships.

Underwriters' Golf Tournament. At the Menlo Country Club on May 14, the San Francisco Association of Marine Underwriters held its annual golf tournament. C. P. Crossan, chairman of the tournament committee, was the recipient of many congratulations on the success of the affair, and on the choice of prizes. The handicaps were set by Frank Jansen. After the tournament play, dinner was served in the club rooms and a large and happy time was had by all.

Group Insurance. Fifty-two employees of the Interocean Steamship Corporation, with headquarters at San Francisco, have recently become eligible to life insurance in amounts ranging from $1,000 to $4,000 each, according to rank and age, through the adoption of a group policy involving a total of $124,000.

The policy, issued by the Prudential Insurance Company of America, is of the contributory type, the employees themselves paying a part of the premium and the remainder of the expense being assumed by the employing company.

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Gauge Explosion. Investigation of the explosion of a compressed air gauge on the U. S. Salvador, resulting in a serious eye injury to one man, disclosed the fact that a small leak had developed in the gauge coil, allowing air to escape into the "airtight" case. As this escaping air built up pressure in the case, the glass burst and shattered fragments were blown into the eyes, face and scalp of the operator who happened to be reading the gauge at the time of the explosion. The "0 to 300-lb." gauge burst as the pointer indicated 210 lbs. pressure.

In order to prevent a recurrence of this accident, it is suggested that pressure gauges be provided with a suitable vent hole drilled in the case to prevent accidental building up of pressure. The vent hole can be covered or plugged with a soft material so that foreign matter would be prevented from entering the case, yet the plug would blow out before the pressure reached a point sufficient to shatter the glass cover.

Attention is also invited to the advisability of incorporating a siphon in the line to all steam gauges to permit a water cushion and prevent the hot steam from reaching the coil and influencing the accuracy of the gauge readings. A safety vent should also be provided in the case. —U. S. Engineers Safety Bulletin.

Fireproof Cabins. Tests carried out recently on the U. S. Shipping Board remodeled cargo carrier, Nantasket, have demonstrated that it is entirely feasible and not over costly to build ships' staterooms with commercial materials now on the market so that any fire started in such staterooms will burn itself out without communicating itself to any adjoining room, provided that doors and windows are kept shut.

The cabins used in this test were each equipped with 2 steel beds with mattresses and bedding, clothes hanging on wall hooks, drapes on portholes, a wardrobe, rugs, and two trunks, containing 300 pounds of rags; every effort was made to stimulate the condition of a cabin after several days of occupancy at sea by two not very neat passengers.

The routine of tests on one cabin with all air ventilators turned on was practically as follows:

1. A lighted cigarette was placed on a pillow and another on the bed. The cigarette on the pillow went out. The one on the bed caused a smoldering fire that burned through bedding and mattress.

2. Kerosene was poured over the bed and a match applied. The flame spread to the clothing and the drapes, but burned itself out.

3. A number of small piles of kindling wood soaked in kerosene were distributed around the floor and lighted. This fire burned all the furnishings and the two trunks with rags, but finally burned out "with no fire penetrating to the outside of the walls, doors, or windows".

These fireproof staterooms are excellent, and as much as is practicable all staterooms and public rooms should be fireproofed; but over and above all fireproofing is the necessity of maintaining safe conditions of discipline and morale in the entire personnel aboard ship.

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BUILDING

Progress of Construction

The following Report Contains all the Data Available Concerning the Shipbuilding Work in Progress at the Leading Shipyards of the United States as of May 1, 1936

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: Order placed for **DD400** and **DD401**, two 1500-ton destroyers for U. S. Navy; no dates set.

S.S. El Aguador, S.S. Santa Paula, S.S. Capt. A. F. Lucas, S.S. Pres. Pierce, S.S. Halo, S.S. Pres. Johnson, M.S. Charlie Watson, S.S. Capac, S.S. Makura, S.S. Point Salinas, S.S. Florence Olsen, S.S. Lansing, U.S.S. New Mexico, Tug Gov. Markham, State Dredge No. 4, S.S. Paul Shoup, U.S.C.G.C. Tahoe, S.S. Chiriqui, U.S.S. Tennessee, Barge No. 1-Shell Co., Stm. Sch. San Diego, M.S. Sveaborg, S.S. Calmar, S.S. Florence Luckenbach, S.S. Pres. Taft, S.S. Maunalei, S.S. Penmar, Dredge Golden Gate, S.S. K. R. Kingsbury, S.S. William Luckenbach, Tug Roosevelt, S.S. Pacific President, Dredge Monarch, S.S. Emma Alexander, S.S. Talamanca, S.S. Chas. L. Wheeler, Jr., S.S. Antigua, S.S. Albert Hill, S.S. Santa Elena.

FELLOWS AND STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Hull No. 647, Fellows Craft Universal**, L.B.P. 35′, beam 11′, draft 4′6″, sail area, 450 sq. ft., sloop rig; engines twin 30 horsepower, universal flexifour; keel laid November 25, 1935; estimated delivery March, 1936; 95 per cent complete March 15, 1936; delivered May 2, 1936.

Auxiliary cutter for R. S. Cooper, Burbank, Calif.; L.B.P. 43′3″; beam 12′0″; draft 6′5″; length water line 31′9″; sail area 1061 sq. ft.; motor Kermath Sea Bird; 30 h.p. motor with 2 to 1 reduction gear; propellers 3-blade Hyde feathering; keel laid Feb. 17, 1936; delivery estimated 90 days; designer John J. Alden, Boston, Mass.; delivery delayed by strike.

Two Fellows Craft 30′ stock model streamline Cruisers delivered; one to Ed Loche, Balboa, Calif.; and one to Mrs. Clara H. Young, San Francisco.

DRYDOCK, PAINT, MISCELLANEOUS: 14 yachts.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

NEW CONSTRUCTION: **2 wooden lighters, 70′x24′x6′** for Alaska Packers Association; delivered May 2, 1936.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Delarof, M.S. Motormates, S. S. Santiam, S.S. W.R. Chamberlin, Jr., Oil S. Port Costa, S.S. Solano, Ferry Issaquah, S.S. Tulsagas, S.S. Noyo, U.S. C.G. Shawnee, Tug Richmond, S.S. Lumberman, S.S. Kanak, S.S. Makawao, Tugs Yankee and Elizabeth, S.S. Buffalo Bridge, S.S. Golden Harvest, S.S. Mana, S.S. Malama, S.S. Unimak.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Helen Whittier, S.S. Lurline, S.S. Maine, U.S.A.T. Ludington, S.S. Maui, S.S. Mauna Loa, S.S. Maunakea, S.S. President Coolidge, S.S. President Lincoln, S.S. President Garfield, S.S. Steel Navigator, M.S. Stranger.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Pt. Loma, Tug Macray, Hopper Barge No. 20, Hopper Barge No. 24, U.S.C.G. Pioneer, M.V. Velma, S.S. Tejon, Blanche W, Jimmie K, S.S. Cabrillo, Yacht Volador, L. A. Fireboat No. 3.**

THE MOORE DRYDOCK CO.
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Maliko, Patterson, Diana Dollar, Margaret Dollar, Frances, Water Barge No. 30, Madrono, Willzipo, Edwin Christenson, Barrhill, Stn. Whl. Crockett, American Star, Tug Hercules, Gold King, Arizonan, Mathew Luckenbach, Golden Mountain, E. C. Hale, Redwood, Kewanee, Glacier, Hubert Schafer, Ohioan, Dakotan, Tahoe, Bering, E. P. Ripley, Guide, H. T. Harper, Chirikof, Golden State, West. Pac. Barge No. 3, Richmond, Midway, American Eagle, Brunswick, Sobre Los Olas, Pegasus, Oakland Dredge, Dauntless, Dakotan, Alaska Standard, Peter Kerr, Yacht Shawnee, Sea Scout, Tacoma, Pres. Lincoln, Samoa, Despatch No. 3.**

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: **Dom. Govt. Snagboat Essington**—Annual overhaul commenced. **M.B. Katherine B**—Docked, cleaned, painted, annual overhaul. 28 ship repair jobs not requiring docking. 29 commercial jobs.

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); LBP, 334′; beam, 35′ 1/8″; loaded draft, 10′10″; geared turbine engines; express type boilers; keel laid August 15, 1934; launched, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); LBP 334′; beam, 35′⅛″; loaded draft, 10′10″; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; launched Dec. 31, 1935.

Two 1500-ton destroyers for U. S. Navy; order placed August 21 1934: **DD392, Patterson**, keel laid July 23, 1935; and **DD393, Jarvis**, keel laid August 21, 1935, estimated completion dates, February 1, 1937 and May 1, 1937, respectively.

Construction of **Destroyer No. 408, U.S.S. Wilson** no date set.

Care and Preservation (out of Commission): **Aroostook, Jason, Kearsarge, Patoka, Pawtucket, Prometheus, Pyro.**

DRYDOCK, PAINT, MISCELLANEOUS: **Utah, Nevada, New York, Maryland, Northampton, Swallow, Mahopac, Tatnuck, Challenge, Wando.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Andrea Luckenbach, S.S. Lewis Luckenbach, S.S. Lake Frances, S.S. Arthur Baldwin, S.S. Otsego, S.S.**

IN AMERICAN SHIPYARDS

Edited by J. Suitor

General W. C. Gorgas, M.S. Northland, S.S. Depere, S.S. Point Estero.

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith**, Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934, launched April, 1936.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery May 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154′; beam 38′; two i.h.p. Atlas engines; keel laid May 25, 1935; launched Jan. 14, 1936; delivery date not given.

Hull No. 114. One purse seine boat; 82′ L.B.P.; keel laid September 1, 1935.

Orders received for **4 purse seine fishing vessels.** Complete data next month.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges;** 132′ x 35′ x 10′; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; 25 delivered.

Six standard steel coal barges, 175′ x 26′ x 11′ for Tri-State Transportation Inc.

One derrick boat hull, 90′x30′x5′; for Halliday Sand Company, Cairo, Ill.; delivered.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hull No. 159, **Drayton (DD 366), torpedo boat destroyer.** U.S. **Navy; keel laid, March** 20, 1934; launched March 26, 1936; estimated delivery June 18, 1936.

Hull No. 160, **Lamson (DD 867), torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launching,** June 17, 1936; estimated delivery, August 13, 1936.

Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis and DD396 Jonett;** Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935.

(Continued on Page 222)

Bids on Matson Cargo Liners

Bids on two cargo liners for the Matson Steamship Company with alternate design, calling for single-screw, 13½-knot speed, and for twin-screw 16-knot speed were opened recently with the following results:

TWO TWIN-SCREW—16 KNOT

		Each	
1.	Newport News	$2,613,000	Single screw alternate
2.	Newport News	2,705,000	
3.	Moore	2,782,534	Plus tax
4.	Sun	2,863,000	
5.	Federal	3,096,000	We assume risks
6.	Bethlehem East Coast	3,362,000	
7.	Federal	3,384,000	They assume risks
8.	New York Shipbuilding	3,420,000	
9.	Bethlehem West Coast	3,659,000	Including Tax

TWO SINGLE-SCREW—13½ KNOT

1.	Newport News	2,308,000	
2.	Moore	2,341,836	Plus Tax
3.	Sun	2,390,000	
4.	Federal	2,583,000	We assume risks
5.	Federal	2,823,000	They assume risks
6.	Bethlehem East Coast	2,845,000	
7.	New York Shipbuilding	2,900,000	
8.	Bethlehem West Coast	3,128,000	Including Tax

It will be noted that the low Pacific coast yard bid is less than 4 per cent above the low Atlantic coast bid on the twin-screw, 16-knot job, and that the same Pacific coast yard is less than 2 per cent above the low bidder on the single screw job. No announcement has been made by the Matson Navigation Company, but these figures are close enough to raise the hopes of many who would like to see this work awarded to a Pacific coast yard. If the Atlantic coast bid is for delivery at the yard and the expense of bringing the vessel out, and of inspection 3000 miles from home office is considered, it may be that Moore is low bidder.

Shipbuilding Shorts

- **Bath Iron Works**, Bath, Maine, will deliver DD366 Drayton, torpedo boat destroyer for the U.S. navy in the middle of June. Drayton's keel was laid March 20, 1934; and she was launched March 26 of this year.

- **Defoe Boat & Motor Works**, Bay City, Michigan, has received order for a U.S. lighthouse tender to be 175 feet in length, 34 feet beam, and 10 feet draft. She will be powered by two triple expansion steam engines of 1000 horsepower. Keel will be laid on July 1, and delivery is set for February, 1937.

- **General Engineering and Drydock Company**, Oakland, California, delivered on May 2, the wooden lighters (70 feet x 24 feet x 6 feet) which they completed for the Alaska Packers Association.

● **The Pusey & Jones Corporation,** Wilmington, Delaware, delivered on May 9, the Nantucket Lightship, No. 112, to the U. S. Department of Commerce, Bureau of Lighthouses. She has a length between perpendiculars of 121 feet 6 inches; a beam of 31 feet; and a 13 foot loaded draft. She is powered by a compound engine of 600 indicated horsepower; two watertube boilers, 165 pounds pressure. Her keel was laid on July 17, 1935; and she was launched March 21, 1936.

● **Fellows and Stewart,** Wilmington, California, report the following marine engine sales during May:

3 three-cylinder 5-inch by 7-inch Hill diesel stationary engines for auxiliary power in tuna clippers. Sold to Campbell Machine Co., San Diego.

1 six-cylinder Hill diesel engine 5-inch x 7-inch with 2 to 1 reduction gear to same firm for powering a fifty foot fish boat.

1 25-horsepower Universal Utility Four gas engine to Smith Maid Boat Works, Los Angeles, for 25-foot boat.

1 25-horsepower Universal Utility Four gas engine to Yacht Seyelyn for powering tender.

1 47-horsepower J.V.B. gas engine to M. Jessick, Newport Beach, for fish boat.

1 single cylinder Universal Fisherman gas engine to Geo. Rock, Newport Beach, for fish boat.

● **American Bridge Company,** Pittsburgh, Pa., have delivered 25 of the 30 barges (132 feet x 35 feet x 10 feet, weight 7500 tons with cargo house) which they are building for the Mississippi Barge Lines, St. Louis, Mo.

● **The Dravo Contracting Company,** report 38 hulls under construction, with a total tonnage of 15, 744. These are chiefly barges, except for four towboats.

● **Manitowoc Shipbuilding Company,** Manitowoc, Wisconsin, reports orders for one steel dumpscow and one steel drydock section for Great Lakes Dredge and Dock Company of Chicago.

● **The New York Shipbuilding Corporation,** Camden, New Jersey, was the scene of the launching of U.S.S. Selfridge, destroyer DD357, on May 18, 1936.

● **Fellows & Stewart,** Wilmington, California, delivered two Fellows-Craft 30-foot stock model stream line cruisers during the month of May—one to Ed Locke of Balboa, California; the other to Mrs. Clara H. Young, of San Francisco.

● **Bath Iron Works,** Bath, Maine, are building a diesel electric ferry for the United States Navy to be delivered in October of this year. Other new work at this yard includes four single screw, steel, diesel propelled trawlers for Boston owners, to be delivered in the late fall.

William S. Brusstar Passes at Oakland

William S. Brusstar, who during recent years was superintendent of the Anderson & Cristofani Boat Yard, passed away very suddenly on April 26, 1936, in Oakland, Calif.

Born in Baltimore, Maryland, 86 years ago this May, Mr. Brusstar has been actively identified with shipping and shipbuilding during his entire adult life; the Brusstar family having been interested in shipbuilding since the 1750's.

He came to Oakland, Calif., as superintendent of the old W. A. Boole & Son's yard in 1905. After several years with that firm, Mr. Brusstar engaged in ship construction work in his own yard. During the World War period he was superintendent of the Hodge Shipbuilding Company at Moss Point, Mississippi.

He is survived by his widow and eight children, among whom is Mr. Delano Brusstar, Senior Inspector, Division of Construction and Maintenance, U. S. Shipping Board Merchant Fleet Corporation, Baltimore, Maryland.

William Brusstar was very popular among the shipping fraternity on the Pacific Coast, as well as on the Atlantic and Gulf seaboard, especially among the old-time wooden shipbuilders, and a host of friends mourn his passing, and extend heartfelt sympathy to his widow and family.

Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively, **DD-396,** keel laid, Mar. 26, 1936. **DD394,** keel laid April 8, 1936.

Hulls Nos. 164, 165, and 166, trawlers, single screw, steel, diesel propelled, for delivery in July or August, 1936, to Boston, Mass., owners.

Hull No. 167, Ferryboat **Aquidneck.** Diesel electric ferry for U.S. Navy; estimated delivery, October, 1936.

Hull No. 168, Trawler, single screw, steel, diesel propelled, for delivery to Boston, Mass.; owners, during November, 1936.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA-39, Quincy,** 10,000 tons. Keel laid Nov. 15, 1933; launched June 19, 1935; estimated delivery May, 1936.

Heavy Cruiser CA44, Vincennes, 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD361, Clark, keel laid January 2, 1934; launched October 15, 1935; estimated delivery May, 1936.

DD362, Moffett, keel laid, January 2, 1934; launched Dec. 11, 1935; estimated delivery May, 1936.

DD363, Balch, keel laid, May 16, 1934; estimated delivery, June, 1936.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers**—steam—425'x64'x34' for Gulf Refining Co.; total tonnage 7070 each.

CHARLESTON SHIPBUILDING & DRYDOCK CO.

Charleston, S.C.

NEW CONSTRUCTION: **One 60-ft. all-welded lighter** for stock. Rebuilt 6 lighters (wooden) for Chesapeake Corp.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Erviken, Tug Barrenfork, Tug Waban, Tug Hinton, Tug Lockwood, Tug Cecelia, Yacht Neelia, S.S. Saccarappa, Tug Congdon, Yacht Chereo, Relieflightship 109, S.S. Seven Sea Sound.**

COLLINGWOOD SHIPYARDS, LTD.

Collingwood, Ont.

S.S. Bayton, bulk freighter; owner —Colonial Steamship Co., Sarnia, Ont. Docked Apr. 27, 1936. Tail shaft drawn for examination, stern bearing relined, hull caulked, odd rivets tightened up, etc.

S.S. D. B. Hanna, bulk freighter; owner—Union Transit Co., Toronto. Docked April 30, 1936. Tail shaft drawn for examination, stern bearing relined. Sundry hull repairs.

S.S. James B. Foote, bulk freighter; Union Transit Co., Toronto. Docked April 30, 1936. Tail shaft drawn for examination, stern bearing relined. Sundry hull repairs.

Tug Zelda, steel tug; John Harrison & Sons Co. Ltd., Owen Sound, Ont. Docked May 15, 1936. Tail shaft drawn for examination. Sundry hull repairs.

Tug Pinola, wooden tug; John Harrison & Sons Co. Ltd., Owen Sound, Ont. Docked May 15, 1936. Tail shaft drawn for examination, hull caulked and sundry repairs.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One yacht, L.B.P. 115′, beam 17′-6″, loaded draft** 5′6″; speed loaded 16 miles per hour; keel laid February 15; launched October 15; estimated delivery, June 1936.

165 ft. Diesel-driven, **all steel mail boat** for U. S. Mail Service on Detroit River.

One 175′x34′x10′ tender for U.S. Lighthouse Dept. Two triple expansion steam engines; total horsepower 1000; estimated keel laying, July 1, 1936; estimated delivery, February 1, 1937.

THE DRAVO CONTRACTING CO.
Engineering Works Dept., Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997**, one diesel sternwheel towboat of 91 gross tons.

Hull No. 1243, 1 covered cargo barge 132′ x 35′ x 11′ for stock, of 513 gross tons.

Hulls Nos. 1244-1245—two welded towboat hulls 145′ x 32′ x 6′4″ for Pittsburgh Coal Co., of 600 gross tons.

Hulls Nos. 1246-1255, inclusive; 10 welded coal barges 175′ x 26′ x 10′8″ for stock of 4720 gross tons.

Hulls Nos. 1257-1261, inclusive; five welded W-2 coal barges; 175′x26′x 10′8″; of 2360 gross tons.

Hulls Nos. 1262-1265 inclusive; four welded flush deck cargo box barges, 100′x26′x6′6″; 660 gross tons.

Hull No. 1267, 1 steel coal barge 130′x34′x4′3″ for Pennsylvania Railroad Company, 530 gross tons.

Hull No. 1268, 1 steel hull for towboat, 173′x34′6″x7′2″ for John W. Hubbard, Pittsburgh, Pa.; 770 gross tons.

Hulls Nos. 1269-1271 incl., 3 welded steel fuel flats, 125′ x 26′ x 8′; tonnage 780.

Hull Nos. 1272-1281, incl., 10 welded W-2 coal barges, 175′ x 26′ x 10′8″.

This makes a total of 38 hulls under contract, with a total gross tonnage of 15,744.

ELECTRIC BOAT CO.
Groton, Conn.

Hull No. 20, **Tarpon (SS175)**: L.B.P. 298′; beam, 25′; standard displacement, 1315 tons; keel laid, Dec. 22, 1933; launched September 4, 1935; delivered.

Hull No. 23, **Perch**, S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; launched May 9, 1936.

Hull No. 24, **Pickerel, S.S. 177** keel laid March 25, 1935; estimated launching, July 7, 1936.

Hull No. 25, **Permit**, S.S. 178, keel laid June 6, 1935; estimated launching, October 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser** and **DD369 Reid** for the U. S. Navy, estimated completion dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington**; keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937.

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938.

Two 12,800 tons tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; estimated completion dates October 1936 and December 1936, respectively.

MANITOWOC SHIPBUILDING CO.
Manitowoc, Wis.

NEW CONSTRUCTION: **One steel dredge hull** for U.S. Engineers.

One steel dump scow and **one steel dry dock section** for Great Lakes Dredge and Dock Co., Chicago, Ill.

MARIETTA MANUFACTURING CO.
Point Pleasant, West Virginia

NEW CONSTRUCTION: **Ten standard steel coal barges**, 175′ x 26′ x 11′ for stock; 6 completed.

Three all-welded steel oil barges, 150′x30′x7′ for export.

Two steel needle flats; 40′x14′x3′6″; for Engineers' Office, Cincinnati, Ohio.

Four all-welded oil barges; 175′x35′ x8′6″; 6,000 barrel capacity each, for Standard Oil Company of New Jersey, for service on Ohio River.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359** aircraft carrier **CV5, Yorktown**, for U. S. Navy; keel laid May 21, 1934; estimated launching, April 4, 1936; original contract for delivery, October 3, 1936.

H360 aircraft carrier, **CV6, Enterprise**, for U.S. Navy.; keel laid July 16, 1934; original contract for delivery February 3, 1937.

H361, light cruiser, **CL47, Boise**, keel laid Apr. 1, 1935; original contract for delivery, August 22, 1937.

H362, light cruiser **CL49, St. Louis**; estimated keel laying Sept. 7, 1936; estimated delivery, Jan. 2, 1939.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356)**, launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357)**, launched April 18, 1936; **Hull No. 410, McDougal (DD358)**; **Hull No. 411, Winslow (DD-359)**; of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge**, Feb., 1936; **DD358, McDougal**, Apr., 1936; **DD359, Winslow**, June, 1936; **CL42, Savannah**, Aug., 1936; **CL43, Nashville**, Dec. 1936; and **CL46 Phoenix**, August 1937.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 1063, Nantucket Lightship No. 112**, building for U.S. Dept. of Commerce—Bureau of Lighthouses; L.B.P. 121′-6″, beam 31′, loaded draft 13′, compound engine, 600 i.h.p., 2 watertube boilers, pressure 165 pounds, keel laid July 17, launched March 21, 1936; delivered, May 9, 1936.

Hull No. 1064—One steel hull towboat building for Donaldson Towing & Lightering Co., Phila., dimensions: 95′ L.O.A. 88′ L.B.P. x 24′ x 14′ 9″; one Unaflow vertical marine type engine, two cylinders 25″ dia. x 20″ stroke, 130 R.P.M. 600 I.H.P. One Scotch type boiler 13′ 3″ diam. x 11′ 6″ long, 3 furnaces, 185 lbs. W.P. Estimated delivery, October, 1936.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

NEW CONSTRUCTION: **57 ft. all welded steel hull dredge tender** for Atlantic Gulf & Pacific; L.O.A. 57′ 7″; beam 14′ 0″; depth 7′ 0″; power 140 B. H. P. Fairbanks Morse Diesel Engine.

SUN SHIPBUILDING COMPANY
Chester, Pa.

NEW CONSTRUCTION: **Hull No. 152—steel, twin screw, truck automobile and passenger steamer** for Virginia Ferry Corporation. Length 260 ft., beam 59 ft., depth 19 ft. 1 in. 2 4-cylinder Skinner Unaflow engines — each 1400 S.H.P. 2 Foster Wheeler Water Tube boilers, cross drum sectional header type 285 pounds pressure. Estimated date of keel laying Oct. 15; launching May 18, delivery June 15, 1936.

Hulls No. 153-154—steam, single screw, steel oil tankers for Gulf Refining Company. Length between perpendiculars 425 ft., beam moulded 64 ft., depth moulded to upper deck 34 ft., loaded draft 27 ft. 6 in. Each vessel: 1 2800 S.H.P. Westinghouse cross compound double reduction geared turbine unit; 2 Foster Wheeler type A 3 drum boilers—400 pounds pressure. Estimated dates for No. 153. Keel laying Nov.

15; launching Apr. 24, 1936; delivery May 20, 1936. Estimated dates for No. 154: Keel laying November 30; launching May 2, 1936; delivery July 6, 1936.

Hulls No. 155-156. Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485'6"x68'0"x37'0"; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; launching Sept. 19, 1936; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511'x65'9"x37'; 9800 tons.

Hull No. 160, 1 oil tanker (steam) 520'x70'x40' for Atlantic Refining Co.; 18,500 tons.

TREADWELL CONSTRUCTION COMPANY
Midland and Erie, Pa.

2 15-ton whirler derrick boats—85-foot boom for U. S. Engineers, Huntington, W. Va.

1 Derrick boat for U.S. Engineers at Vicksburg, Miss.

10 Coal Barges, 175'x26'x11', for Pittsburgh Coal Co.

1 steel gold dredge (ladder type) **hull** 155'x70'x13' for South American firm.

UNITED DRYDOCKS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION: **DD364, Destroyer Mahan,** keel laid June 12, 1934; launched October 15, 1935; estimated completion, July 1, 1936.

DD365, Destroyer Cummings, L.B.P. 334'; beam 35'; mean draft 10'10"; keel laid June 26, 1934; launched Dec. 11, 1935; estimated delivery Aug. 1, 1936.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched April 18, 1936; estimated delivery indefinite.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; estimated launching, June 2, 1936; delivery indefinite.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267' overall, 66' extreme breadth, 19'9" depth; keels laid April 4, April 27, and May 1, 1936, respectively; estimated launching, November 17, December 8, and December 29, 1936, respectively; estimated delivery, January 19, Feb. 9, and March 2, 1937, respectively.

UNITED STATES NAVY YARD
Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case, L.B.P. 334'; beam 35';** keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, September, 1936.

Destroyer DD371, Conyngham, L.B.P. 334'; beam 35'; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, November, 1936.

DD389 Mugford and DD390 Ralph Talbot, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May, 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD
Charleston, S.C.

NEW CONSTRUCTION: **U.S.S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; launched Feb. 25, 1936; estimated completion date, June 1, 1936.

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; estimated launching Aug. 1936; estimated completion, Jan. 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B.P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, August, 1936; estimated delivery November, 1936.

CL 48, **Honolulu,** light cruiser; L.B.P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January, 1937; estimated delivery September, 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers.

PG. 50, **Erie,** gunboat; L.B.P., 308'; beam, 41"; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; launched January 29, 1936; estimated delivery, July 1, 1936.

CG 69 and CG 70, **Alexander Hamilton** and **John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308'; beam 41'; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION: **CL41, Philadelphia,** L.B.P. 600'0"; beam 61',7¾"; molded depth at side to main deck amidships 42'0¾"; draft corresponding to normal displacement 21',8½"; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

DD372, **Cassin.** L.B.P., 334',0"; beam, 35',0-1/8"; depth molded at side to main deck amidships 19',7-7/8"; draft corresponding to normal displacement, 10',10"; standard displacement, 1500 tons; keel laid, October 1, 1934; estimated completion date, March 15, 1936.

DD373, **Shaw,** L.B.P. 334',0"; beam, 35',0-1/8"; depth molded at side to main deck amidships, 19'7-7/8"; draft corresponding to normal displacement, 10',10"; standard displacement, 1500 tons; keel laid October 1, 1934; estimated completion, June 15, 1936.

Coast Guard Cutter No. 65, George W. Campbell; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, July, 1936.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61' 9¾", depth molded at side to main deck amidships 42'0 3/8", draft corresponding to normal displacement 21'10"; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS 172, Porpoise; keel laid, October 27, 1933;** launched June 20, 1935; completed Jan. 15, 1936; **SS 173 Pike,** keel laid, Dec. 20, 1933; launched Sept. 12, 1935; commissioned Dec. 2, 1935; estimated delivery, May, 1936; **SS 179 Plunger** keel laid July 17, 1935, estimated delivery Feb., 1937; **SS 180 Pollack,** estimated delivery May, 1937; L.B.P. 289' 0"; beam 24' 11-1/16"; loaded draft 13'9"; diesel electric engines.

Two 1400-ton submarines, SS185 Snapper and SS186 Sturgeon, order received from Navy Department; September, 1935.

Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

Clay Hutchinson Advanced

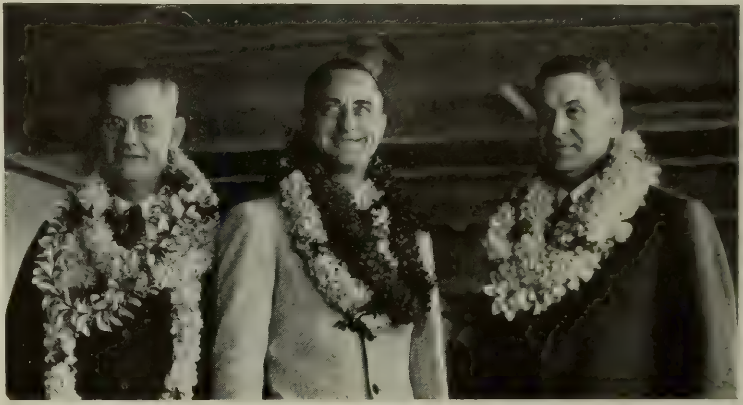
Clay Hutchinson, a pioneer in point of maritime passenger experience, and one of the best known and popular steamship men on the Pacific Coast succeeded **Roy Crowder** as general passenger agent of the Grace Line, with headquarters in San Francisco, on June 1.

Hutchinson's first experience in the maritime industry came when, as a youth in San Francisco, he joined the old Pacific Mail Steamship Company. With the dissolution of that company, he joined the newly organized Panama Mail Steamship Company with headquarters in Los Angeles. After more than 30 years experience in the passenger business on the Pacific coast, Hutchinson has become one of the most widely known and popular executives engaged in the transportation business in the west.

Hector M. Hunt, manager of the States Steamship Company's Far Eastern services, directing the affairs of the trans-Pacific freighter and passenger operations, has resigned from that position to open a general agency and brokerage business of his own in Portland.

Hunt's first shipping experience was in Seattle with Frank Waterhouse and Company. He joined the Yamashita Shipping Company at Portland shortly after the World War, and within a short time became local manager. He left that company to join the States organization. For several years he has been one of the chief counsellors in rate affairs to the Trans-Pacific Westbound Conference.

For a time Hunt's position with the States Line will be left open, his work being assumed by **Donald M. Kerr, Willis K. Clark,** and **W. T. Sexton.**



MATSON OFFICIALS ARRIVE IN HONOLULU

Matson officials arrive in Honolulu to discuss passenger traffic business for the summer. Left to right, John E. Ryan, general traffic manager, San Francisco; Earl Hedemark, general passenger agent, Castle & Cooke, Ltd., Honolulu; and H. E. Pippin, general passenger agent, Los Angeles office.

—Pan-Pacific Press Bureau Photo.

W. B. Wheeler, passenger traffic manager for Grace Line, with headquarters in New York, spent several days during the month in San Francisco, conferring with **Edward T. Ford,** president; **Fred L. Doelker,** Pacific coast manager; and other Grace Line coast officials.

One of the best known ocean transportation men in the United States, Mr. Wheeler took a very optimistic view of the possibilities of transportation during the coming season. He declared that people who had foregone vacations involving sea-voyaging for the past five or six years were now making definite inquiries and bookings, which will set a new high in ocean travel for 1936.

Roger D. Lapham, president of the American-Hawaiian Steamship Company, and a director of the San Francisco Bay Exposition, Inc., became San Francisco's first official "ambassador" to Europe for the 1939 World's Fair, when he sailed from New York on the zeppelin Von Hindenburg to extend an invitation to European nations to participate in the exposition. He will visit Berlin, Hamburg, Copenhagen, Paris and Madrid on the trip.

F. Clare Thompson, formerly assistant general freight agent of the American Mail Line at Seattle, has resigned to enter the firm of Earl F. Townsend & Company, investment securities.

James R. Clark, assistant cashier in the Los Angeles office of the Grace Line for the past four years, has been appointed chief of the foreign freight department to succeed **Joseph Sweeney,** according to **Guy E. Buck,** district manager.

George Bushnell, newly appointed head of the McCormick Steamship Company in Oakland, has taken up his duties at the Ninth Avenue Terminal, replacing **George Pell,** recently promoted to the company's head offices in San Francisco.

Bushnell has been associated with the McCormick Lines for the past ten years, having been successively office manager at Pier 37 in San Francisco; private Secretary to Charles Wheeler, president of the line; and agent at Vancouver, B.C.

The Propeller Club of California Announces a Marine Safety Contest

To the Shipowner addressed
Subject: **Marine Safety Contest**
Dear Sir:

You are cordially invited to enter your Company's vessels in the Marine Safety Contest for 1936, that is being sponsored by the Propeller Club of California, with the support of the Accident Prevention Bureau of the Shipowners' Associations, for the purpose of perpetuating the interest of the Pacific Coast American Shipowners, their ships' masters, officers and unlicensed personnel, in the prevention of injuries to seamen, as well as to attract nation-wide attention to the safety activities of the Merchant Marine of the Pacific Coast.

An attractive bronze plaque will be awarded to the company whose fleet of vessels in each of the four following classifications has the lowest **reportable** injury frequency (based on crew man hour exposure) during the period July 1st to December 31st inclusive. The four classifications are (a) Steam Schooners, (b) Passenger Carriers, (c) Tankers, and (d) Freighters.

A special certificate will be awarded to the companies winning second and third places in each classification as well as to each vessel, regardless of classification, that works the minimum prescribed crew man-hours for the period July 1st to December 31st inclusive without a **disabling** occupational injury to any member of its crew.

In further recognition of any exceptional safety record made by vessels during the Contest period, the Committee has determined that any vessel attaining the certain reportable injury frequency, as stated in the printed Contest Rules and Regulations, shall be entitled to fly a special safety flag during the year 1937. This flag shall be of special design and approved by the Contest Committee.

The presentation of each plaque and certificate will be accompanied by impressive ceremonies appropriate to the event.

The Contest is limited to:

(1) American flag vessels calling at the ports of San Francisco Bay or Los Angeles Harbor.

(2) Such vessels in each classification as have worked the minimum number of man-hours prescribed in attached Rules and Regulations.

(3) Such vessels as agree to and do furnish accurate reports of injuries and man-hours worked in accordance with the Rules.

(4) Such vessels as submit signed entry blanks properly executed by the company's chief operating executive on or before June 15.

The Accident Prevention Bureau has agreed to receive, analyze and tabulate each vessel's injury reports and man-hours, and will hold all individual and company details strictly confidential in accordance with its established custom, submitting to the Committee in charge of the Contest only such information as is required on Vessel Monthly Report Form. However, any company not desiring to furnish the Bureau with copies of its accident reports may submit each vessel's monthly experience to the Contest Committee on the form above-mentioned.

The Accident Prevention Bureau also agrees to assist each contesting vessel, master and his Ship's Safety Committee by furnishing material suitable for programming and administering the intensive six months accident prevention effort.

The Contest will be in complete charge of a joint committee composed of nine members from the Propeller Club and the Pacific Coast Marine Associations' Executive Safety Committee.

It will be appreciated if you will use the enclosed Entry Blanks for entering each vessel in the Contest and mail same to Stanley Allen, Secretary, Propeller Club of California, 320 Market Street, San Francisco, California. An exact copy of each Entry Blank for your vessels will be made and mailed to you for your files.

Please keep in mind that the closing date is June 15th. However, it is suggested that you send in your entries by return mail so that immediate arrangements can be made for furnishing you with such material for each vessel as will be needed for administering its special accident prevention program.

It is further urged that you immediately notify each master of the Contest giving such particulars and instructions as you may deem necessary.

I pledge you the full cooperation of the Committee in Charge.

Very truly yours,
JOSEPH J. GEARY
President.

Annual Spring Banquet Huge Success

"A Night in Spain" lured a grand turnout of Propellers and their guests. The Terrace Room of the Fairmont Hotel was transported into the land of the Dons. An excellent show was staged and all hands reported one of those rollicking times which are traditional in Propeller Club annals . . . where Jinkes are concerned. Dick Glissman, as chairman, turned out a swell job and is to be highly congratulated by all who came aboard for this gala occasion. A hit of the evening, and there were plenty of highlights, was the "Spick" banquet fare. The usual good fellowship prevailed on all sides from the moment we boarded the lugger until the "sign-off" bugle.

● Safety Contest

The Propeller Club is sponsoring a safety contest for American ships operating out of California ports. This is one of the most important programs which the Club has ever undertaken and the Board of Governors has set up a strong committee entrusted with the responsibility of handling all details. An outline of the Contest will be published in this section of Pacific Marine Review and we invite our ship operating readers to study it with a view of sending their entries to Stanley E. Allen, secretary of the Club. The personnel of the Committee: B. O. Pickard, Chairman, Stanley E. Allen, F. M. Edwards, Chas. E. Finney, C. Lyn Fox, Edward H. Harms, H. M. Kelly, W. T. Lion, R. W. Myers.

### ● Luncheon Meetings

In our last issue we reviewed the luncheon held on April 28 with guest speaker Captain R. C. Dwyer, superintending commander of the California Nautical School.

May 12. Guest speaker was our fellow member E. T. Bullard, a pioneer in safety work on the Pacific Coast. Mr. Bullard gave a most interesting talk on the safety work which is being conducted in principal industries around this area tying in his remarks with marine safety work aboard ship, alongside the docks, and in other strictly marine locales. He also presented a fine motion picture depicting safety procedure practiced during the building of the Golden Gate Bridge. Chairman of the day was Edward H. Harms.

Maritime Day, May 22. We observed this occasion by holding a joint luncheon with the San Francisco Junior Chamber of Commerce Marine Committee and other local marine organizations. A banquet was served at the Commercial Club in San Francisco and speakers of the day on the history and needs of the American merchant marine were Harry Scott and Ralph Myers.

Pacific Marine Personals

S. T. Lashbrook, assistant traffic manager for the Interocean Steamship Company in Los Angeles, was seriously injured recently when the driver of a truck loaded with pipe, failing to see Lashbrook standing behind the truck, backed into him. He is confined to the Santa Fe hospital where it is expected he will have to remain for several months. Lashbrook has been with the Interocean for about a year, having for nine years previously been with the Nelson Steamship Company.

James F. Hall, well known to shipping men and masters of vessels from all parts of the world as customs boarding officer and station inspector, died May 15, after an illness of several months.

Edward T. Ford, president, and **Fred Ducato,** freight traffic manager of Grace Line spent some time in Los Angeles recently conferring with **Guy E. Buck,** district manager there. When Ford returned to San Francisco, Ducato remained to represent Grace Line at the Western Traffic Conference.

E. N. Tormey, district manager of the Interocean Steamship Corporation and K Line agent, has announced the appointment of **Joseph Sweeney,** as assistant traffic manager in direct charge of the K Line's new west coast schedule to Central and South American ports. Sweeney has twenty years of shipping experience to his credit, most of which was spent with Grace Line, where he was chief of the foreign freight department at the Los Angeles office.

Hector M. Hunt, for the past five years Portland manager of the Far Eastern services of the States Steamship Company, has resigned to launch his own business, Hector M. Hunt Company, steamship agency and brokerage firm.

Roy S. Wintermute, vice president in charge of the northwest district of the General Steamship Company, was a San Francisco visitor during May.

George Eggers, former traffic manager of the States Steamship Company at Portland, is now marine superintendent for Sudden & Christenson in San Francisco.

Announcement of the line up of Admiral Line skippers for the coming season include:

Captain Charles G. Hansen to resume his former command, the H. F. Alexander;

Captain Fred Nystrom to command the Ruth Alexander; and

Captain G. A. Harris, who has been master of the Emma Alexander for a number of years, to skipper the "Emma".

J. Lance McCalley, freight and traffic manager at Chicago for the United Fruit Company, arrived in San Francisco aboard the Antigua, accompanied by Mrs. McCalley. He expressed the greatest confidence in the shipping and travelling situation for the coming season.

A San Francisco visitor during May was **John Middleton**, head of Babcock & Wilcox Company, New York, who arrived aboard the Panama Pacific liner Pennsylvania.

Captain S. C. S. McNeill, credited with saving more lives at sea than any other steamship master, died on May 8 in Hampshire, England. When he retired as commander of the Mauretania in 1933, Captain McNeill had saved 520 persons from distressed vessels. He was the first Cunard Line officer to become Staff captain, having received this promotion when he was assigned to the Mauretania.

Joseph Sweeney, after twenty years of service with the Grace Line, and its predecessors, Panama Mail and Pacific Mail Lines, resigned his post of chief of the foreign freight department in Los Angeles recently to assume an executive post in the Los Angeles offices of the Interocean Steamship Corporation. Sweeney's successor will be **R. C. Clark**, formerly assistant cashier in the Grace Los Angeles offices.

Andrew Furuseth, leader of American seamen for the past fifty years, is critically ill in a Washington hospital. He is 82 years old, and is still president of the International Seamen's Union. He went to Washington in connection with lobbying for seamen's legislation.

● Joins Algoma Plywood Firm

Mr. George I. Fischer, well known in the industrial plywood field through his connection during the past eight years with the Haskelite Maanufacturing Corporation, has joined the new Technical Division of the Algoma Plywood & Veneer Company. Mr. Fischer's duties with Haskelite were as an engineer and also included sales promotion and advertising work. He will fill the same capacity with the Algoma Technical Division, which was recently established by the Algoma Company under the direction of Mr. James R. Fitzpatrick, long a recognized authority in the field of technical application of plywood products and himself an engineer. Mr. Fischer will also act as direct assistant in the Chicago Office to Mr. Fitzpatrick.

Mr. Fischer is a graduate of the College of Engineering at Northwestern University, with the degree of Bachelor of Science and Civil Engineer. Following his graduation he spent a year, prior to his connection with the Haskelite people, with a consulting engineer in the transportation and utility field. Mr. Fischer is a member of the S.A.E. fraternity and a First Lieutenant in the Infantry Reserve.

● Todd Moves General Offices

The Todd Shipyards Corporation and Subsidiaries, one of the oldest organizations engaged in ship repair and conversion — from the smallest harbor vessel to the greatest ocean liner—has removed its general offices to One Broadway, New York City.

Encompassing the three coasts of the United States with full facilities at their plants in New York, Hoboken, Mobile, Galveston, New Orleans and Seattle, Todd for generations has furnished marine service and engineering in a comprehensive program which has bound together the facilities of 200 acres of land and water surface, two graving docks, 26 floating docks, 25 piers, ninety shops, eight power plants, ten service vessels, one marine railway, three shipbuilding ways and a personnel of several thousand skilled workers. Perhaps the greatest single contributing factor in the success of the Todd Shipyards has been their policy of centralized service, with each plant functioning as a separate unit, but still as a part of an integral whole.

Both graving docks of the Todd Corporation are the only privately owned docks of their type and size in New York harbor, while the twenty-six floating dry-docks of the company range in capacity from 500 to 16,000 tons. The combined capacities of the drydocks permit the docking of 175,000 tons of shipping at one time. Shop equipment, including a dynamic balancing machine for turbine motors weighing up to twenty tons, is complete and modern and fitted for virtually any marine job.

Todd services also offer fuel oil burners, oil burning equipment and marine oil burning galley ranges, which are manufactured by Todd Combustion Equipment, Inc., in Brooklyn, N.Y., and also by Todd Oil Burners, Ltd., of London, England. "Hex-Press", one of the Todd models, an air register and mechanical pressure atomizing oil burner has been approved by the U. S. Navy for use on all types of naval vessels.

Chas. R. Page, vice president Fireman's Fund Group of fire and casualty companies, will leave San Francisco June 3 for New York City. In addition to visiting company departmental offices in New York, Mr. Page will stop in Chicago, remaining in the East about three weeks before returning to the head office in San Francisco.

—Fireman's Fund Group.

J. W. Clague, district passenger agent for the Dollar Lines at Shanghai, is enjoying a four month vacation in San Francisco.

L. E. Archer, passenger traffic manager of the Panama Pacific Line, spent some time during the past month on business in the Pacific Northwest.

George A. Pope, Jr., president of the Pacific-Argentine-Brazil Line; and **A. R. Baldwin,** member of the Board of Directors of the McCormick Steamship Company and Charles R. McCormick Lumber Company, have been making an inspection tour of the combined holdings of the companies in Washington and Oregon. George A. Pope, Jr. is the son of the president of McCormick Steamship Company.

A. B. Cahill, president of Sudden & Christenson, is enjoying a vacation in Tahiti accompanied by Mrs. Cahill.

Dwight W. Hill, manager of the Portland office of Burchard & Fisken, Inc., has been appointed northwest traffic manager, according to an announcement by **H. W. Burchard,** president of the company.

Joe Friedlander, traffic representative for Swayne & Hoyt, returned the first of June from two weeks spent in New York and Philadelphia.

● Plymouth Expert on Rope Safety

Speaking recently to a group of safety engineers, a representative of the Plymouth Cordage Company pointed out that maintaining the safety factor of manila rope is a twofold responsibility. The initial responsibility rests on the manufacturer, but after he has put the best adapted grades of fiber and the most skillful workmanship into his product, it is then up to the user to treat his rope with the simple care necessary to safeguard these factors.

The three chief causes of rope deterioration which reduce the safety factor are, excess loading, external abrasion, and internal wear.

Of these, external wear is the most readily detected. When the surface threads of a small rope have been worn about half way through, the rope should be discarded. In a larger rope, however, having many inside yarns, the surface or cover yarns may be worn somewhat deeper before the rope becomes unsafe for use.

Internal wear, due to excess binding and tension, is revealed by the presence of a white powdery residue of the inside yarns. By unwinding one yarn from the strand the extent of this damage may be detected. Under most working conditions, internal wear is not a serious factor.

The most serious abuse of any rope is excess loading. Any load beyond 75 per cent of the rope's breaking strength will cause permanent injury. This type of damage may be detected by examination of the inside yarns which will be wholly or partially broken, depending on the amount of overload. If the rope is given periodic inspections for accidental cuts and abrasions, and a reasonable factor of safety is used for determining the load, about 5 for most conditions, it will give long, safe, dependable service.

It is a great advantage, especially at night or in fog, to be able
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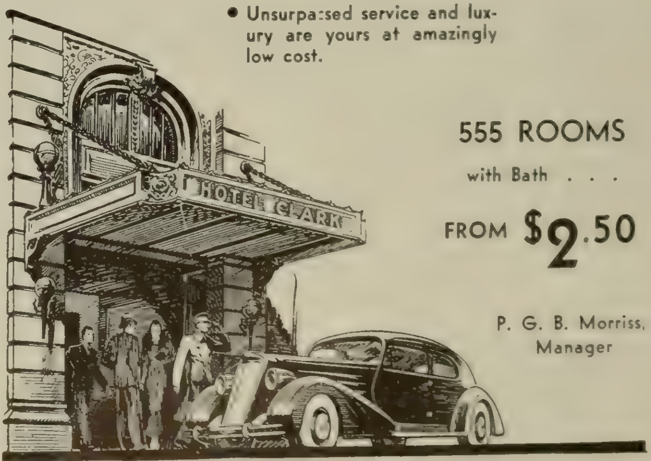

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Claude C. Gillum, Manager-Lessee
BERKELEY
California

Quips That Pass in the Night!

This little squib is published after a discussion during which Winton's engineer. Mr. C. H. Teed, and purchasing agent, Mr. A. O. Cash, had reached an impasse about the different types of salesmen encountered during the day.

Mr. Teed handed your reporter the following which is printed for what it is worth:

An engineer is said to be a man who knows a great deal about a very little, and who goes along knowing more and more about less and less until finally he knows practically everything about nothing.

Whereas, a salesman, on the other hand, is a man who knows a very little about a great deal, and keeps knowing less and less about more and more until he knows practically nothing about everything.

A purchasing agent starts out knowing practically everything about everything, but ends by knowing nothing about anything, due to his association with engineers and salesmen.

A Tall Rope

Mark Twain once sat in the smoking room of a steamer and listened for an hour to some remarkable stories. Then he drawled: "Boys, these feats of yours that you've been telling about recall an adventure of my own in Hannibal. There was a fire in Hannibal one night, and Old Man Hankinson got caught in the fourth story of the burning house. It looked as if he was a goner. None of the ladders was long enough to reach him. The crowd stared at one another with awed eyes. Nobody could think of anything to do.

"Then all of a sudden, boys, an idea occurred to me. 'Fetch a rope!' I yelled.

"Somebody fetched a rope, and with great presence of mind I flung the end of it to the old man. 'Tie her around your waist!' I yelled. Old Man Hankinson did so, and I pulled him down."

He Had Same Feet

He was a stout man, with large broad feet, and although several pairs of boots were shown to him he refused them.

"I must have square toes," he explained to the assistant.

The young man sighed. "But square toes are not stocked now, sir," he insisted. "Pointed toes are fashionable this season."

The stout man gave an angry stare. "That may be," he retorted, "but I happen to be wearing last season's feet."

Some Baby

"It says in the paper that a baby fed on elephant's milk gained twenty pounds in two weeks."

"I don't believe it; whose baby was it?"

"The elephant's."

Three Reasons

An engineer, upon being asked to have a drink, replied: "No, I don't want a drink for three reasons: First, because I promised my mother not to drink; second, because my doctor told me not to drink; and third, because I just had a drink."

Liars

"Folks," said the colored minister, "the subject of my sermon dis evenin' am 'Liars.' How many in de congregation has done read the sixty-ninth chapter of Matthew?"

Nearly every hand in the congregation was raised immediately.

"Dat's right," said the preacher, "You is just de folks I want to preach to. Dere is no sixty-ninth chapter of Matthew."

Not Perfection

Wife (heatedly): "You're lazy, you are worthless, you're bad tempered, and you're a liar."

Husband: "Well, my dear, no man is perfect."

Restricted

"Frequent water-drinking," says the specialist, "prevents you from becoming stiff in the joints."

"Yes," says Imogene, "but some of the joints don't serve water."

Insistent

Drunk—"Shay, call me a cab, will-ya?"

Bystander—"My good man, I'm not a doorman, I am a naval officer."

Drunk—"Awright, then call me a boat, gotta get home."

Your Question!

A Scotchman and an Irishman were waiting in a far western town for a train. To pass the time away Mac said to the Irishman, "Pat, I'll ask you a question, and if I can't answer my own question I'll buy the tickets. Then you ask me a question, and if you can't answer your own question you'll buy the tickets."

"Okay, shoot."

"Well," said Mac, "do you see those prairie dog holes out there?"

"Yes."

"How do they dig them without leaving any dirt around?"

"That's your own question, answer it yourself."

"They begin at the bottom and dig up."

"How the devil do they get to the bottom?"

"That's your question, answer it yourself."

(Pat bought the tickets)

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American Hawaiian Str. Virginian on dry dock for cleaning and painting at Moore Dry Dock Company, Oakland, California. Dutch Boy Red Lead Primer was chosen because of its fast drying and lasting resistance to severe weather and water conditions.

ASK THE NATIONAL LEAD MAN

FAST WORK IN THE DRY DOCK

Not all the speed records are made at sea. Many of them are made in getting ships in and out of dry dock, and most of those are made where Dutch Boy Red Lead Primer is used.

This quick-drying primer saves time in dry dock—2 or 3 coats can be applied in one day—reduces "cost per dead weight ton per year". It has extremely long life—resists effects of water and abrasion — cuts cost of paint maintenance.

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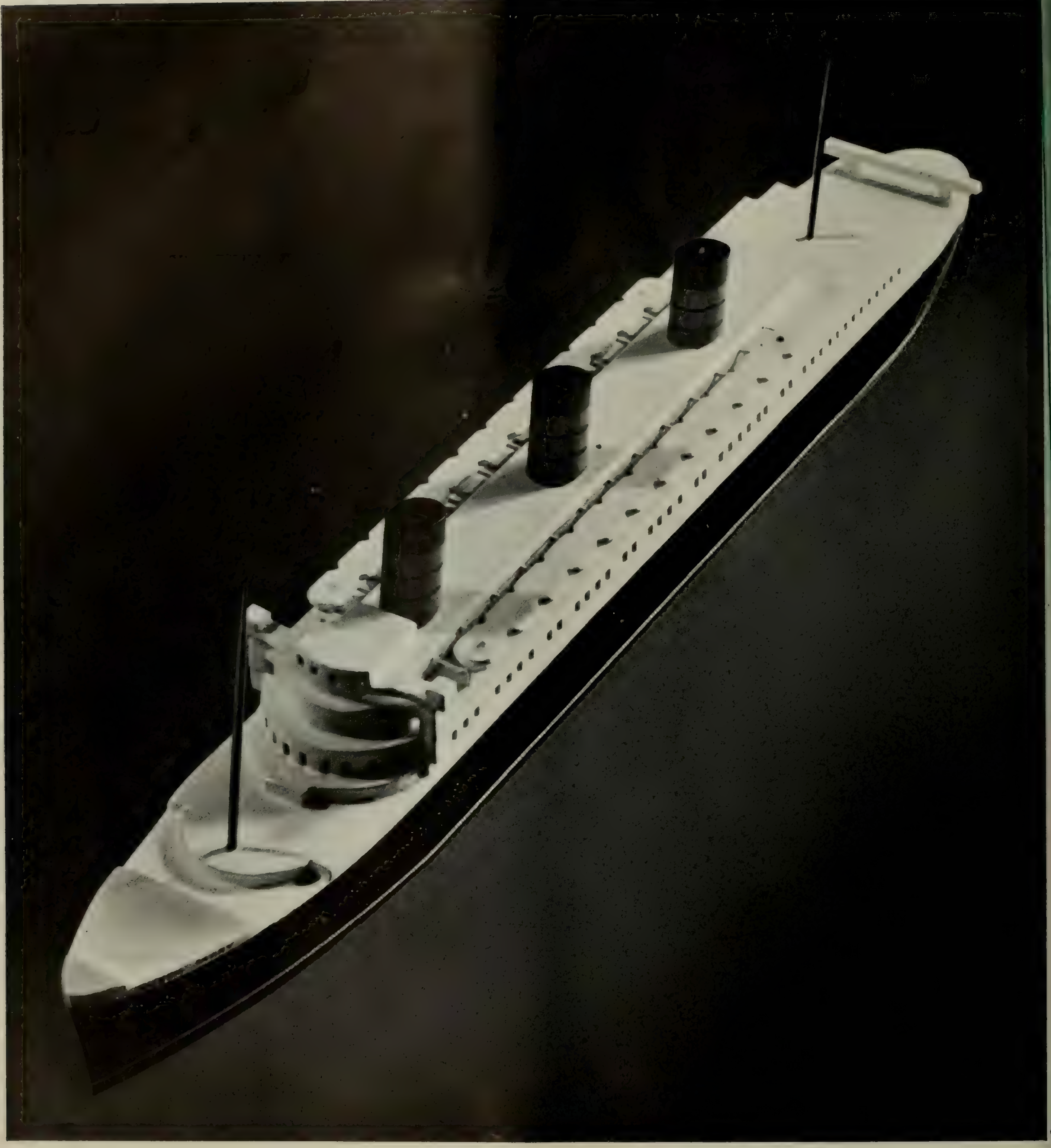


THE S. S. QUEEN MARY
MODEL BY VAN RYPER

Engraving courtesy
THE WALTER J. MANN CO.
San Francisco

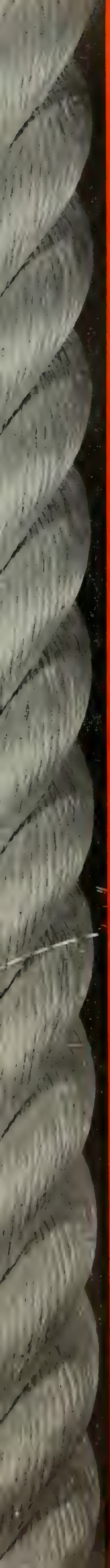
PACIFIC MARINE REVIEW

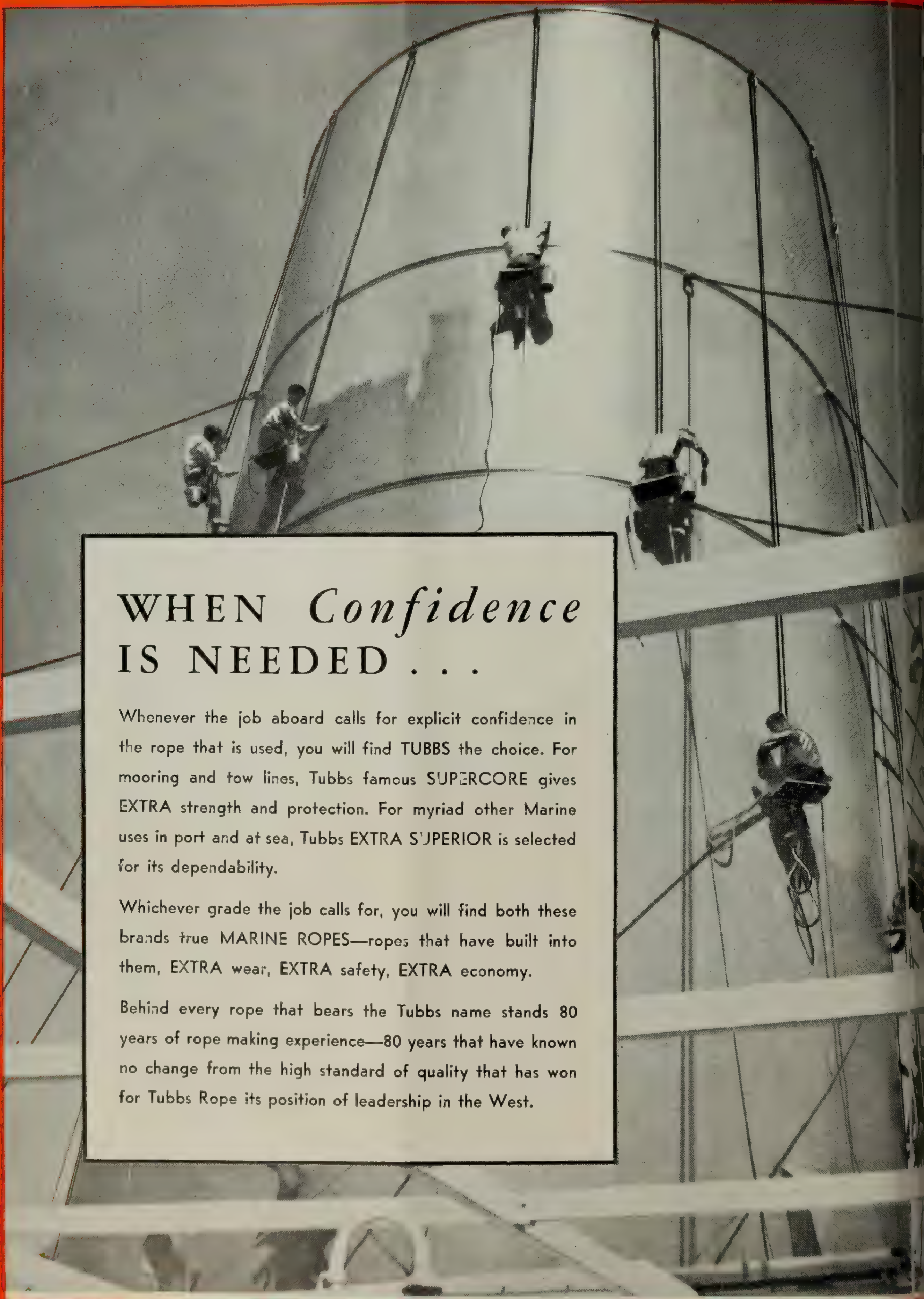
JULY 1936

A 95-ton Lift by No. 4.

See Contents Page.

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION
SHIPOWNERS ASSOCIATION
OF THE PACIFIC COAST





Tubbs Rope at Sea . . .

WHEN *Confidence* IS NEEDED . . .

Whenever the job aboard calls for explicit confidence in the rope that is used, you will find TUBBS the choice. For mooring and tow lines, Tubbs famous SUPERCORE gives EXTRA strength and protection. For myriad other Marine uses in port and at sea, Tubbs EXTRA SUPERIOR is selected for its dependability.

Whichever grade the job calls for, you will find both these brands true MARINE ROPES—ropes that have built into them, EXTRA wear, EXTRA safety, EXTRA economy.

Behind every rope that bears the Tubbs name stands 80 years of rope making experience—80 years that have known no change from the high standard of quality that has won for Tubbs Rope its position of leadership in the West.

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PACIFIC MARINE REVIEW

JULY, 1936
VOL. XXXIII NO. 7

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. . . . OUR COVER

Haviside No. 4 lifting a 95-ton pile driver used in constructing San Francisco-Oakland Bridge piers. This pile driver was lifted and placed at different locations about eighteen times by the Haviside Company—a difficult lift which had to be slung perfectly to maintain the proper balancing point. As our picture shows, there was very little room to land the pile driver, with bad weather requiring further skill.

PUBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

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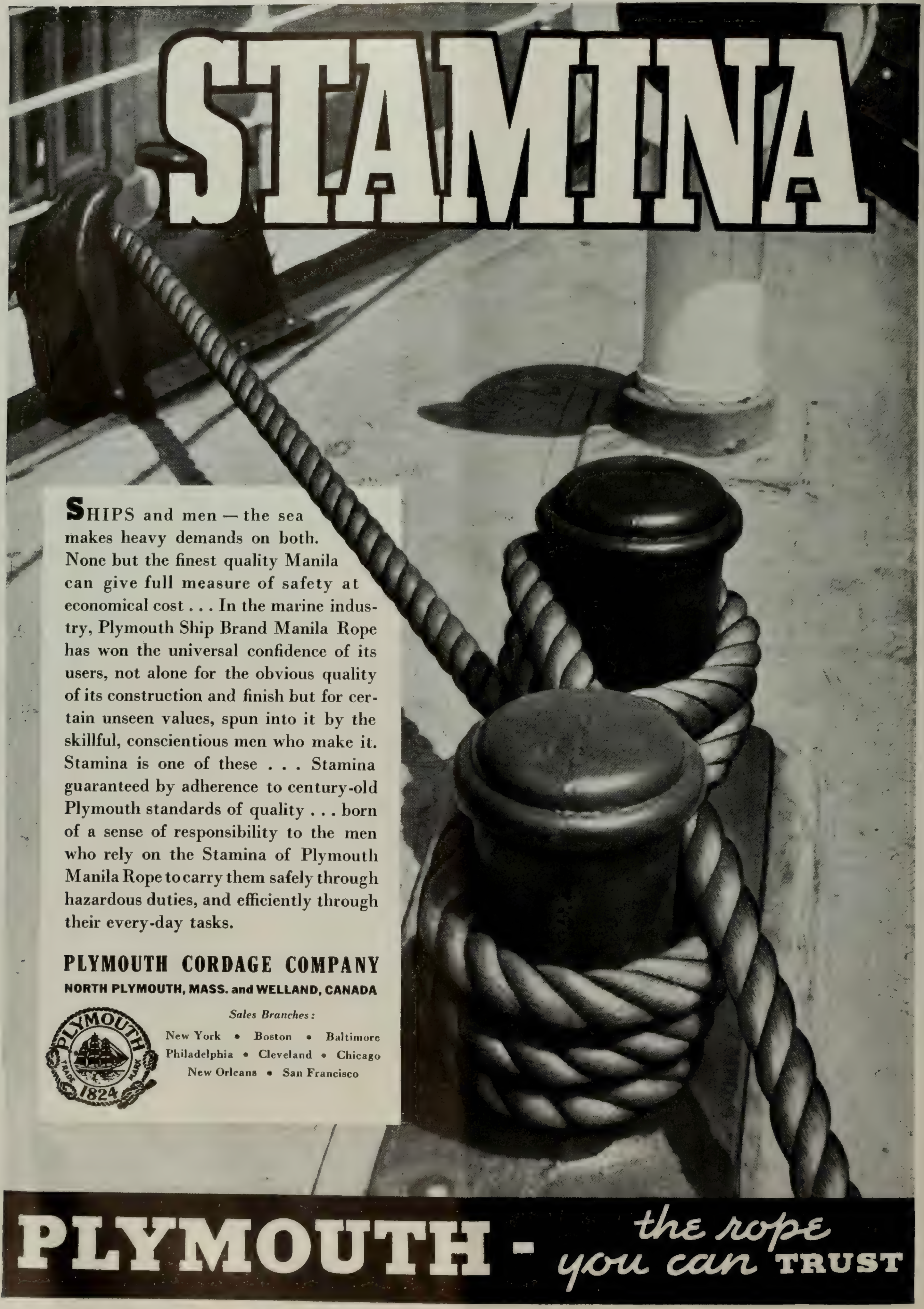

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PACIFIC MARINE REVIEW

VOLUME XXXIII JULY 1936 NUMBER 7

Editorial Comment »« »«

The New Subsidy Shipbuilding and Operative

At the time of writing, there is before the president for signature, a compromise Subsidy Bill which in the closing moments of Congress was rushed through the Senate and the House amidst a huge barrage of more than eighty amendments.

How many of these were approved and made effective, we do not know, and we doubt whether anyone in Washington knows. The substance of the bill remains practically as printed in the amendment to the House subsidy measure sponsored by Senators Copeland, Guffey, and Gibson, and is reliably reported to have been inspired by President Roosevelt. We may therefore assume that it will become law.

This measure sets up a Maritime Commission (or Authority) of five persons, to whom will be delivered the American Merchant Marine. This commission will have all the assets and powers of the Shipping Board Bureau and the Merchant Fleet Corporation. The five commissioners will be chosen by the president. Not more than three can be of any one political party. It is a full-time job, and each commissioner will draw $12,000.00 a year salary.

The bill authorizes and limits the duties, powers, and expenditures of the Commission in many important particulars, and especially in the matter of subsidies.

All ocean mail contracts now in force are to be terminated before June 30, 1937. Direct subsidies of two kinds—construction differential and operation differential—are set up in lieu thereof. The construction differential subsidy clauses authorize the Commission to construct ships for foreign trade, under competitive bidding, in American shipyards for American shipowners. The Commission will make to the shipbuilder cash payments equal to:

(1) The cost of any national defense features that have been added to the design at the request of the U. S. Navy;

(2) The difference between the cost of building an identical ship in the principal foreign yards available to the foreign competitors, and the cost in the American yard (up to 50 per cent of the American cost without (1).)

The American shipowner must assume the remainder of the cost, payable as follows: twenty-five per cent of entire cost as a cash payment during construction, and the balance in twenty annual installments plus three and one-half per cent interest.

In bidding on ships for Pacific Coast owners, the ship must be built in any Pacific Coast shipyard whose bid is within six per cent of the lowest bids in other districts.

Shipbuilders must file complete and reliable cost data, are limited to 10 per cent profit, and no salary over $25,000 is allowable.

Matson Navigation Company passenger liner Lurline, one of the fine recent replacement units of the Pacific Coast merchant fleet.

The Commission is authorized to take in obsolete ships at a fair valuation as part payment on construction differential subsidy contracts. Such ships may be scrapped or resold, domestic or foreign.

The Commission may, if bids are unsatisfactory, have ships built in navy yards, and if private shipowners seem slow in their building programs, is directed to build on its own, and either charter to private owners or itself operate these ships until such time as they can be sold for private operation.

Operation differential subsidy is limited to the excess over foreign competitors of the "fair and reasonable cost of insurance, maintenance, repairs, wages, subsistence, and any other items of expense in which the Commission shall determine that the applicant is at a substantial disadvantage." This subsidy will be determined and be payable on an annual accounting basis, with minimum wage, manning, housing, subsistence and working condition scales specified by the Commission, and with specified limitations on shipowner as follows:

No vessel over 20 years old is eligible;

No salary of over $25,000 a year is allowable;

Reserve fund equal to depreciation must be set aside annually before any dividends are paid;

Dividends limited to 10 per cent on capital investment;

All profits over 10 per cent go into special reserve fund, which must be maintained at a minimum of 5 per cent of capitalization, the excess to be used for reimbursement for losses of shipowner, delayed payments to Commission or, after all of foregoing have been satisfied, special dividends.

For coastwise and intercoastal domestic shipping, no subsidies are provided. On new construction for these trades, the Commission will pay outright the value of any national defense features, and will loan up to 75 per cent of cost at 3½ per cent interest, payable in 20 yearly installments.

It would seem plain from the foregoing that this is a good workable scheme, providing we get the right five men as commissioners. It is also very evident that the administration intends to have a large merchant shipbuilding program, both for naval auxiliary and for international trade purposes. We of the Pacific Coast should be intensely interested in getting proper representation on this Commission. Our stake in the shipowning and shipbuilding industry is very large.

In ships of 1,000 gross tons or over, the Pacific Coast firms own and operate in the foreign and domestic trades over 350 vessels, with a total gross measurement of nearly 2,000,000 tons. Many of these ships are over 20 years old, and a still larger number are very close to that age. This great fleet of ships would, under any rational replacement program, require the construction of at least 80,000 gross tons annually which, of course, would be a very nice program for Pacific Coast shipyards. But when we consider the fact that there has been practically no replacement program on the great majority of this fleet for the past 15 years, we begin to realize that when conditions are ripe for this program, it will start with a rush and assume tremendous proportions.

The provisions of this subsidy bill, if properly administered, will be very powerful inducements toward such a building program.

Pacific Coast shipbuilding is by no means dead. It has been somewhat moribund, but its organization and its former well-known driving force could be brought to life very suddenly with a few contracts. There are at least seven American shipyards on the Pacific Coast capable of building units in the merchant fleet replacement program and in the naval auxiliary program. These seven yards have at least 21 shipbuilding ways, and plenty of room for extension. Their combined present capacity would accommodate over 100,000 gross tons of ships building simultaneously.

Let's get busy and see that our Pacific Coast shipowners get more cargo and passengers, and our Pacific Coast shipyards more ships to build.

The Postal Contracts An Appreciation

American shipowners, through their spokesman, John M. Franklin, president of the American Steamship Owners' Association, speaking at a recent Congressional hearing, registered a very strong plea for a clear, reasonable subsidy measure, and a fine comprehensive survey of the benefits arising from the Merchant Marine Act of 1928. We quote excerpts from their statement:

"What a remarkable situation American shipping is placed in! Hardly without dissent it is the common belief that an American Merchant Marine is absolutely necessary to national prosperity and our defense. The events of the last few days have emphasized more than ever the truth of this declaration. Whatever may have been the situation in the past, it must be evident to everyone that in the face of world conditions today the American Merchant Marine must be maintained. It can be maintained and developed under private ownership much more efficiently and economically than under Government ownership, a fact which has already been demonstrated as a result of the experience which America has undergone since the War.

"Surely, then, a bill can be written in which there will be every reasonable safeguard accorded to the public interest, in which there will be given a reasonable opportunity for a fair return on private capital, and yet a bill which is sufficiently clear in its terms to be understandable, so that an American citizen who is willing and desirous of putting his money into shipping securities can know in what he is investing.

"In considering any legislation, we feel that the gains made under existing legislation should be borne in mind. These may be summarized as follows:

"(1) The contracts have served to sustain the American Merchant Marine throughout the greatest depression ever visited on world shipping, during which the greatest maritime nations have fostered their shipping by greater aid and more preferences than for many generations. Large personnel has thereby been kept employed. More than one-third of American foreign commerce has in recent years been carried under the American flag as compared with less than 10 per cent before the War. Eighty-one per cent of the seamen (unlicensed personnel) on American ships in foreign trade are American citizens as compared with 54 per cent in 1927.

"(2) By regular and sustained operations on more than forty services calling at hundreds of ports this personnel and its officers (100 per cent of whom are American citizens) have acquired a vast amount of knowledge of navigating and port conditions of great value to the Navy.

"(3) The American Merchant Marine has gained its foothold on all trade routes and is respected in the shipping conferences of the world, and thereby has won many important advantages for American commerce and shippers.

"(4) Under existing contracts expiring in 1938 and 1940, contractors are still obligated to build twenty ships of 148,355 gross tons at an estimated cost of nearly $47,000,000, and to reconstruct others at an estimated cost of about $4,000,000. The contracts permit the conditional construction of further vessels at a total cost of $67,000,000. While it is true that not all lines have built new ships, it is a fact that on the principal trade routes there has been new building which has put the American lines in the first position or in an equal position, that certain of the ships have marked a definite advance in American ship design and construction, and that this building between the years 1929 and 1933 provided employment for a large number of men throughout the country at the very depth of the depression. Viewed from the standpoint of relief alone (which was not their purpose when made) the results of the contracts will compare favorably with the relief accorded other industries and agriculture, and with far greater permanent and continuing benefits unless the policy is disrupted and the gains already made are lost.

"(5) If contracts are cancelled such action will be regarded throughout the world as indicating repudiation of American shipping companies by their own Government."

The Postal Contracts . . . A Judicial Appraisement

The Shipping Board Bureau of the United States Department of Commerce is the Federal agency charged with the administration of the Merchant Marine Act of 1928, and with the study of the growth and the future of the American Merchant Marine. It is therefore in a strategic position to know the facts as to the working out of the aids to merchant shipping embodied in that Act. These aids were in two forms: 1—loans to encourage construction of new ships and reconditioning of existing ships; 2—Postal contracts to enable the American ship operator to compete in foreign trade on specified routes with specified ships operating on specified schedules. (Mail being a subsidiary matter carried free in whatever quantities offered.)

James Craig Peacock, Director of the Shipping Board Bureau, in an address delivered before the Propeller Club of Baltimore on Maritime Day, May 22, has given us a very comprehensive picture of the results of this measure as reflected on the records of his Bureau. This address was published in full in the June issue of Pacific Marine Review—however, so much publicity has been given to adverse high powered distorted criticism in the daily press and other media, that a little repetition of favorable facts would seem to be due the much maligned American shipowner.

Here are a few of Director Peacock's trenchant comments:

During the depression, American shipping has experienced all the vicissitudes which have beset the merchant marine of other nations. In addition, it has had to face, continuously for the past three years, a heavy barrage of high-powered criticism, originating strangely enough, not in the countries of its competitors, but among our own people. From every direction the pitiless spotlight of publicity has been turned upon its every weakness and shortcoming, leaving its virtues obscured in the shadows.

Such a steady stream of adverse criticism has poured forth from Congressional and departmental investigations and hearings and debates, from news and editorial writers, and from columnists of influential papers, from after dinner speakers, and even from radio commentators, that the man in the street can scarcely be blamed if he has come to believe that our shipping situation constitutes a veritable scandal and nothing more. The point I wish to make is that there has been enough criticism of the abuses of the past. Surely the American Merchant Marine finds its natural economic handicaps burdensome enough, without this added handicap. What it sorely needs—though in some quarters it is not the fashion to say so—is sympathetic and constructive help.

The oustanding accomplishment which must be placed to the credit of the American Merchant Marine in recent years is the maintenance, on every one of the country's essential trade routes, of regular and dependable service during this entire period of unparalleled stress in shipping and foreign trade. Here is a record that will bear favorable comparison with the showing made by any other merchant marine in the world, a record which is all the more remarkable when we consider the obsolete types of cargo ships which comprise the greater part of our fleet.

Many charges have been made against the operators of American ships. These charges have been given wide circulation and have gained wide credence. Many of them are one-sided and carry their own refutation, as, for example, the sweeping charge in a recent report that instead of an adequate American Merchant Marine, the Merchant Marine Act of 1928 has produced unconscionable exploiters, intent upon wringing every possible penny from the public purse, while giving an absolute minimum of service in return.

In view of recent criticism of American ships from the standpoint of safety, I think it well to point out that all the passenger carrying ships built with Government aid since 1928 have exceeded the requirements laid down by the London Convention for Safety of Life at Sea, notwithstanding that this important treaty has not yet been ratified by the United States.

For the past fourteen years American ships have carried an average of approximately 34.3 per cent of the total value of our foreign waterborne commerce, ranging between a low of 32.2 per cent in 1926 and a high of 36.5 per cent in 1933. Now in analyzing these figures the interesting fact develops that during the past seven years—the period of the great depression—the yearly average is found to be somewhat higher than for the seven years preceding the depression. Does anyone suppose that this just happened by chance or accident? I for one give credit to the business acumen, the ingenuity, and the dogged determination of the American shipowner, who, refusing to take the depression lying down, rolled up his sleeves, improved and intensified his methods of freight solicitation, and more than maintained his relative position while the rest of the business world was in the doldrums praying for a favorable breeze.

All told, 33 new and splendid ships, costing approximately $144,500,000, have been built under the 1928 Act. The conversion or reconditioning of 42 old vessels, with a view to increasing their speed, installing refrigerator space, or making other betterments, has involved an additional expenditure of $17,700,000, making a total outlay of approximately $162,200,000, for modernizing the fleet during the depression years. The result is that our immediate needs in our principal passenger carrying trades are, with a few notable exceptions, reasonably well taken care of. Our need for new cargo liners remains, however, a matter of very real concern.

A fair appraisal of the figures quoted will show the unfairness of the highly critical views so frequently expressed as to the progress made in building up American shipping since the passage of the Merchant Marine Act of 1928. When we consider the employment benefits accruing to American labor through the expenditure of $162,200,000 for building or reconditioning these 75 ships, the added millions paid to American seamen employed to run the newly built vessels, and the increased prestige enjoyed by the American-flag services in which the ships have been operated, it is decidedly unfair to imply that the Merchant Marine Act of 1928 was barren of worthwhile results. The chief defects of the Act were that it disguised the nature of the subsidy; that it did not make mandatory the replacement of obsolete tonnage; and that the method prescribed for determining the amount of Government aid was loose and open to abuses if not properly administered. More than counter-balancing these admittedly serious defects, however, the fact stands out—and I believe that it will be given full recognition when the maritime history of the post-war era is finally written—that but for the subsidy provisions of the Act of 1928, few American lines, other than the so-called industrial carriers, would ever have survived the depression.

On August 9, 1933, when the Presidential order abolishing the Shipping Board and transferring its activities to the Department of Commerce became effective, outstanding ship sales and construction loan mortgages amounted to $154,742,561.80. Today that total has been reduced to $105,728,539.77. In other words, in less than three years $49,014,022.03 or almost one-third of the total, has been paid back to the Government, notwithstanding that by the terms of the loans most of them were to run for 15 or 20 years.

On the same date—August 9, 1933—thirteen active companies were in arrears on such mortgages. Since then only two small companies have been added to the list while on the other hand six of the original thirteen have completely paid up all arrearages. A seventh has for more than two years been making regular payments on a schedule which has already reduced its arrearages from $853,800 to $169,600, with every indication that it will be completely caught up on its payments by November of this year. Two of the six other companies still in default are in appreciably sounder financial condition than they were a year ago, and only two of them have had occasion to resort to receivership.

International Good Will Gesture

The direct and indirect advertising and publicity attending the advent of that great and stately steamship, Queen Mary, was a matter for much thought among the shrewdest public relations counsellors on both sides of the Atlantic. The result was tremendous publicity and millions spent in direct and indirect advertising. Perhaps most valuable in the long run, and certainly in its present aspect the most beautiful, outgrowth of these efforts was the volume of official greetings carried on the first voyage of the great liner, from Mayors of British cities to the Mayors of namesake cities in Canada and the United States.

Nearly 200 beautifully printed scrolls with old English lettering, handsomely illuminated on vellum and parchment, carrying shields and official seals in color, and in some cases accompanied by handsome gifts of silver, were delivered at the New York dock to Western

Union agents. These agents carried the heavy bundles to the Western Union central office in New York by taxi-cab. There they were sorted and dispatched to their destinations under the care of Western Union messengers. At various receiving points, the local Cunard-White Star and Western Union agents waited in attendance upon the mayor or city manager who received them, the scrolls and gifts being presented with appropriate ceremonies at the city hall.

Thus the right honorable Lord Mayor of that ancient city, Bath, heartily felicitated eleven namesake towns and cities located in Maine, New Hampshire, New York, Pennsylvania, Ohio, Indiana, Illinois, North Carolina, South Carolina, Michigan, and South Dakota. The good city of Bristol found 10 namesakes in as many states. The greatest number of namesake towns was found in Massachusetts, the names including Boston, Mansfield, Melrose, Plymouth, Chelsea, Beverly, Leominster, New Hartford, Worcester, Andover, Weymouth, New Bedford, Middlesex, and Southampton.

Towns in a dozen states west of the Mississippi River received these greetings—among them being Aberdeens in California, Washington, South Dakota, Colorado and Montana; as well as Hamiltons in Montana, Nevada, Missouri, and Texas.

The Canadian cities remembered by their godparents, made a necklace from Newcastle, New Brunswick, through London, Ontario, to Aberdeen, British Columbia. The Provost of Fort Williams, England, crossed the Atlantic on the Queen Mary and personally conveyed greetings to officials in Fort William, Ontario.

Thus, today, there are on exhibition in the town halls of over 200 cities on this continent, substantial and lasting official expressions of good will from the people of Great Britain to the people of Canada and of the United States.

Technical Division Marine Inspection Bureau

As authorized under the Act of May 27, 1936, the Secretary of Commerce has set up a new division of the Bureau of Marine Inspection and Navigation to be known as the Technical Division. On June 17, Secretary Roper announced the appointment of Ernest I. Cornbrooks as the Chief of this division.

This is a most excellent choice. Mr. Cornbrooks received his technical education at the University of Pennsylvania. Subsequently, he became associated with the Harlan and Hollingsworth Shipyards as a hull and engine draftsman, which position he held until 1898, at which time he became associated with the Maryland Steel Company in the capacity of hull draftsman, and later as assistant superintendent in charge of the Hull and Engine Department. In 1906 he became associated with the Newport News Shipbuilding and Drydock Company as chief hull draftsman, later becoming superintendent of construction and sales manager. In 1927 he was employed by the New York Shipbuilding Company as Assistant General Manager, where he served successively in the capacities of General Manager and Vice-President.

Widely known in marine circles, Mr. Cornbrooks will be responsible for passing upon all contract plans and specifications for the construction of new, or alterations to existing passenger vessels of the United States of 100 gross tons and over, propelled by machinery, the construction or material alteration of which shall be begun subsequent to the passage of the Act above mentioned, and the performance of such other duties of a similar nature as the Director of the Bureau of Marine Inspection and Navigation may assign.

As Chief of the Technical Division, Mr. Cornbrooks will be directly responsible for supervising all bureau functions dealing with structural, stability and subdivision, load line, admeasurement and engineering problems. Mr. Cornbrooks' years of theoretical and practical experience make him exceptionally well qualified for his new work, with the result that the standards of the American Merchant Marine will, by reason of his employment, rank those of any maritime nation, and the confidence of the industry will be inspired in having at the head of this division, a man of his qualifications. By placing the technical work of the Bureau of Marine Inspection and Navigation under the supervision of such a highly trained executive, the Department of Commerce will be better able properly and more expeditiously to handle the many important problems that arise in this field of work.

Seventeen Graduate Naval Architects

On June 4, was held the 40th annual commencement of the Webb Institute of Naval Architecture, New York, whereat 17 young men graduated with the degree of Bachelor of Science in Naval Architecture and Marine Engineering. Lewis Nixon, President of the Board of Trustees, Webb Institute, made the principal address and presented the degrees. Those being graduated were:

Edgar D. Hoyt with highest honors;

George A. Johnson with honors; and

E. Edward Breault, Raymond V. Bremer, David G. Kingsley, J. Ben McCarty, Jr., Victor E. Scottron, Walter Maximowicz, John G. Hill, Robert M. Donaldson, Fred W. Wemmerus, Arthur B. Millay, F. Everett Reed, Jr., Edward F. Ganly, Allen N. Hoyt, Anthony Karpich, and Alvin Mason.

Webb Institute was founded under the provisions of the will of that great American shipbuilder, W. H. Webb. It is the only school in America that specializes exclusively in degrees in Naval Architecture and Marine Engineering.

Pacific Marine 25 Years Ago

Some Interesting Excerpts from Pacific Marine Review for July 1911

On July 15, 1911, Pacific Marine Review—"First established and only exclusively marine paper published on the Pacific Coast"—issued from its offices at 379-380 Arcade Annex, Seattle, Washington, as a book of 40 pages. H. B. Jayne was editor, owner, and publisher, with Captain Emil Franke as associate editor, and the R. L. Davis Printing Company as press. The ads of 60 well-known firms covered 16½ advertising pages. Of these, 21 were shipping lines, 6 were shipbuilders, 14 were marine machinery manufacturers, 9 were ship supply houses, and 9 marine insurance firms. Great changes have taken place during the past 25 years. There has been much consolidation, and many well known names have disappeared from the Pacific maritime horizon, yet 30 per cent of the firms then advertising are still represented in the pages of Pacific Marine Review.

The lead article is entitled "Suez and Panama Canals" and is a quotation from a British shipping leader calling attention to the effect that the opening of the Panama Canal will have on the Suez Canal business and on the advisability of changes in the tariff structure and increases in capacity and convenience at Suez.

Herr Ballin, the (then) chairman of Hamburg-American Line, in reviewing "The American Shipping Trade" warmly denounces the foolishness of the Anti-Trust Movement in the United States, which is the cause of "the great commotion and uncertainty which have prevailed in American business for some years. Nothing is worse for the development of commerce than such periods of uncertainty. By its action, the government is obstructing the further development of the country, and does far more injury to small fortunes than to large ones."

The new U. S. battleship, Utah, built by the New York Shipbuilding Company at Camden, New Jersey, had completed her acceptance and standardization tests, and had made 21.63 knots. She had a displacement of 21,247 tons, and was fitted with Parsons geared turbines, developing 28,477 horsepower.

U. S. Department of Commerce figures for the fiscal year ended June 30, 1911, showed ship construction in United States yards to have totalled 1,123 steam and motor vessels of 246,540 gross tons total measurement. The largest vessel built was the William Palmer, 7,602 gross tons, a Great Lakes freighter. Largest seagoing vessel was the Honolulan, an American Hawaiian cargo carrier of 7,059 gross tons.

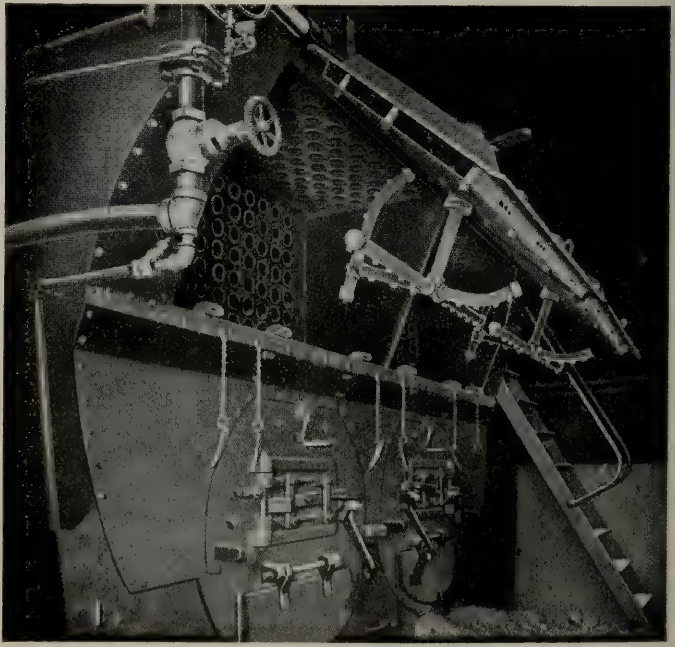
No American flag vessel was built for foreign trade that year.

The Diamond Power Specialty Company announced a new type of soot blower, especially designed for Scotch firetube marine boilers.

The steam cargo carrier, Robert Dollar, for the Robert Dollar Company, San Francisco, had been launched at Port Glasgow, Scotland, on June 2. This vessel, built especially for the lumber trade, across the Pacific, was 410 feet long, 54 feet beam, and 29 feet depth, with a capacity of 8,860 tons deadweight on 24-foot, 2-inch draft. Her chief feature was elimination of the bulkhead between after holds, leaving a clear space 180 feet long for lumber.

There appeared also an abstract of a paper by Charles Algernon Parsons on "Twelve Months' Experience With Geared Turbines on the Cargo Steamer, Vespasion." This vessel had a 1,000 horsepower Parsons turbine, and single reduction gearing. The tests proved that gearing was of decided advantage, and very practical.

The Pacific Coast Steamship Company figured large in vessel casualties during the 30-day period under re-



Improved Diamond soot blower for Scotch marine boilers as illustrated in Pacific Marine Review, July, 1911.

view. On June 28, S.S. Spokane, bound for southeastern Alaska ports from Seattle, "struck a rock in Seymour Narrows, and was beached to prevent sinking in deep water. Contract for floating her had been let to British Columbia Salvage Company, maximum remuneration to be $35,000. The steamer, valued at $250,000, was insured locally and in England."

S.S. Santa Rosa, bound from San Francisco to San Diego and way ports, "struck near Point Arguello on the morning of July 7, and will be a total loss. The steamer, valued at $200,000, was covered with insurance. The cargo worth $100,000 was partially covered."

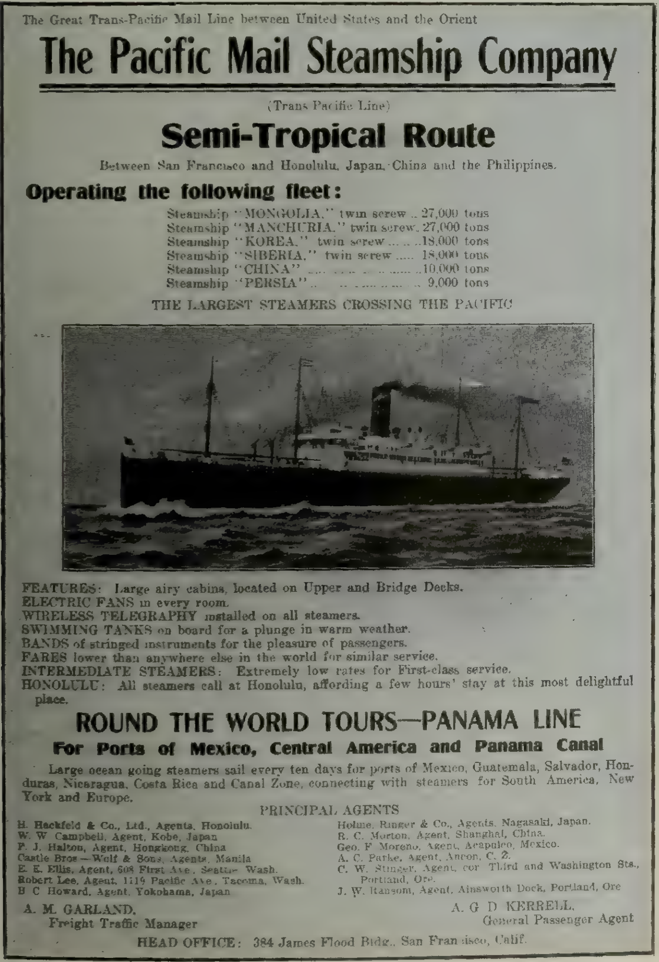
The great late Robert Dollar became a contributor to Pacific Marine Review in the July, 1911, issue, with a short article under the caption, "American Ships Flying Foreign Flags," which we quote in full:

"A carefully prepared list of American citizens who are known to own ships sailing under foreign registry shows 270 large vessels including the largest ships afloat. Their gross tonnage amounts to 1,300,487 tons. It is impossible to get a complete list as the vessels stand in the names of foreigners or foreign corporations, but it is quite safe to say that there are at least 300,000 tons more. This would make 1,600,000 tons gross, being just about double the tonnage owned by Americans and flying the American flag, and engaged in foreign commerce.

"This should bring very forcibly to even those who are not engaged in foreign trade that there is something radically wrong when forty of the large shipping companies who are prohibited by our laws from successfully operating these ships under the flag of their country are compelled to put their property in the name of a foreigner to get the protection of the flag of his country.

"Now, seeing that those American citizens are able to own and operate these vessels, no reasonable minded man can say that they are not entitled to the protection of the flag of their own country. This is a condition and not a theory, and our laws cannot prevent our citizens from going into the shipping business although they have to do it in a roundabout way.

"In times of peace it might be said that there would be no advantage in having this fine fleet of steamers registered as American bottoms, comprising as it does nearly 6 per cent of all the tonnage in the world, but in the event of war what a strength and efficiency is lost to the United States and gained by other nations whose shipping laws are framed on far more liberal lines than our navigation laws which are completely out of date and not in keeping with the progressive laws of our more enterprising neighbors."



The Great Trans-Pacific Mail Line between United States and the Orient

The Pacific Mail Steamship Company

(Trans Pacific Line)

Semi-Tropical Route

Between San Francisco and Honolulu, Japan, China and the Philippines.

Operating the following fleet:

Steamship "MONGOLIA," twin screw .. 27,000 tons
Steamship "MANCHURIA," twin screw. 27,000 tons
Steamship "KOREA," twin screw ....18,000 tons
Steamship "SIBERIA," twin screw ..... 18,000 tons
Steamship "CHINA" ....10,000 tons
Steamship "PERSIA" .... 9,000 tons

THE LARGEST STEAMERS CROSSING THE PACIFIC

FEATURES: Large airy cabins, located on Upper and Bridge Decks.
ELECTRIC FANS in every room.
WIRELESS TELEGRAPHY installed on all steamers.
SWIMMING TANKS on board for a plunge in warm weather.
BANDS of stringed instruments for the pleasure of passengers.
FARES lower than anywhere else in the world for similar service.
INTERMEDIATE STEAMERS: Extremely low rates for First-class service.
HONOLULU: All steamers call at Honolulu, affording a few hours' stay at this most delightful place.

ROUND THE WORLD TOURS—PANAMA LINE

For Ports of Mexico, Central America and Panama Canal

Large ocean going steamers sail every ten days for ports of Mexico, Guatemala, Salvador, Honduras, Nicaragua, Costa Rica and Canal Zone, connecting with steamers for South America, New York and Europe.

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B C Howard, Agent, Yokohama, Japan

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R. C. Morton, Agent, Shanghai, China.
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C. W. Stinger, Agent, cor Third and Washington Sts., Portland, Ore.
J. W. Ransom, Agent, Ainsworth Dock, Portland, Ore

A. M. GARLAND,
Freight Traffic Manager

A. G D KERRELL,
General Passenger Agent

HEAD OFFICE: 384 James Flood Bldg., San Francisco, Calif.

This advertisement reproduced from Pacific Marine Review, July 1911, may some day be prized as an historic record.

Port Authorities' Silver Jubilee

Marking an epoch in the history of the American Association of Port Authorities, its 25th annual convention and "Silver Jubilee" will be held in San Francisco beginning September 28, and continuing through October 2, with headquarters in the Fairmont Hotel.

Frank G. White, chief engineer of the Board of State Harbor Commissioners, who was elected president of the association at its annual meeting at Houston last fall, announces that an exceptionally interesting and informative business program is being prepared for the occasion, and delegates are being assured through Tiley S. McChesney, of an opportunity for agreeable social as well as business contacts during their stay in San Francisco and its environs.

President P. W. Meherin, and Secretary Mark H. Gates of the Harbor Board, have joined Mr. White in casting plans for the entertainment of the delegates, their families and friends.

In some respects this convention will be exceptionally important to the Port of San Francisco as it will bring here leaders of the foremost ports and harbors of North America for a few days of exchange of good will and of wide-range discussion of matters affecting shipping and port management.

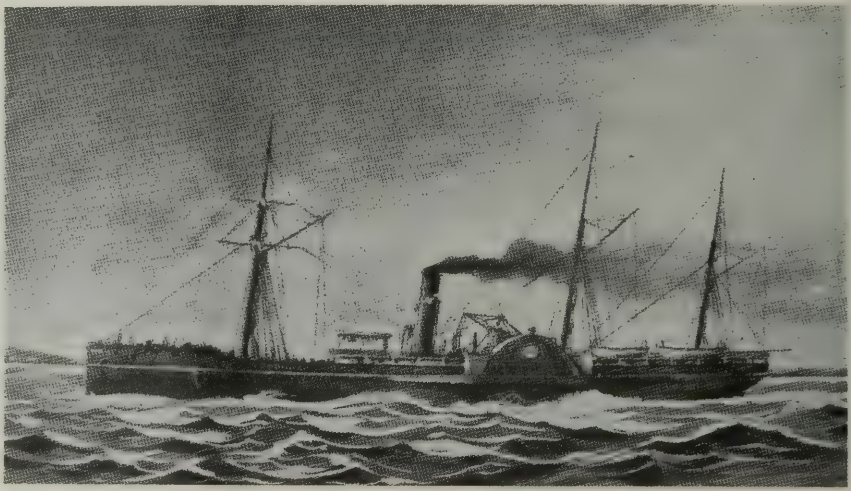
To our good friend Frank White and to the Port Authorities, we extend our best wishes for a happy and profitable convention in San Francisco.

. . . . *Old Time*
Pacific Coast Steamships

No. 4—S. S. Pacific—By R. J. Alexander

With the Aid and Assistance of F. E. Edwards, Captain Neil Henley and Other Old Timers

Only three of the five oceans—Atlantic, Arctic, and Pacific — have loaned their names to ships. Of the few ships so named a very large proportion have met with disaster, usually accompanied with great loss of life. Recounting these unfortunate ships, Henry Woods, S.J., says, "There were the Arctic and the Pacific of the Collins Line; the Atlantic on Long Island Sound, and another Atlantic on Lake Erie; the White Star Company named its second ship the Atlantic, only to see her cast away almost immediately on the Nova Scotia coast; and in all these instances there was great loss of life. Two fine steamers, Great Northern and Northern Pacific were named after two railroads; nevertheless the ocean name was there, and the one bearing it did not escape her fate." The subject of our sketch this month furnishes one of the most striking examples of this singular fatality, and he would be a bold owner, indeed, who today would name his ship after an ocean.



Old Pacific Coast side wheeler Pacific.
(Reproduced from Lewis & Dryden Marine History of the Pacific Northwest.)

S.S. Pacific was one of those fine old wooden side-wheelers, built for the Pacific Mail Steamship Company in the New York yard of William H. Brown in 1851. She was fashioned of white oak and cedar, fastened with locust trenails, and iron and copper bolts, and sheathed with composition. Her principal characteristics were:

Length	223 feet
Beam	31 feet
Depth	17 feet
Draft	12 feet
Tonnage (old)	1100
Tonnage (new)	876

She had two decks, and superstructure, and three masts, rigged as a topsail schooner.

Her side paddle wheels were driven through an overhead beam by a vertical condensing engine, having one cylinder with 54-inch diameter cylinder and 10-foot stroke.

After some years on the Panama-San Francisco run, with an occasional run to Puget Sound and trans-Pacific, she was sold to the California Steam Navigation Company in about 1866, and subsequently to Goodall, Nelson and Perkins, who operated her in the coastwise service, principally between San Francisco and Victoria, with stops at way ports. The records show that she was re-metalled in 1865.

The year, 1875, finds S.S. Pacific still laboring up and down the coast, carrying freight, express and passengers. Her regular capacity was approximately 150 persons but she frequently carried well over 200, especially in the fall, when the flush miners of the British Columbia gold fields were always in a rush to get down to the Barbary Coast.

On November 4, about noon, she left Victoria for San Francisco, with every berth and all standing room filled. Her official passenger list shows 160 persons, of whom 132 had come aboard at Victoria, and the balance from Puget Sound ports. It is known that the purser booked 20 more at Victoria before the ship sailed, and that many rushed aboard without tickets at the last moment. As to what followed, only two of the people on board lived to tell. One of these—Neil Henley, seaman—is still alive at Steilacoom, Washington. He sets the total number of persons on the Pacific at 277.

In command, on the bridge, was Captain J. D. Howell, a brother-in-law of Jefferson Davis, a graduate of Annapolis, who had seen much service in the Confederate navy, and six years service in merchant ships on the Pacific coast. It was a bright clear afternoon, with a stiff south wind blowing up the straits, and kicking up a heavy swell. The night fell clear, with occasional drifts of mist. The Pacific made heavy going against the wind, and at 9:30 she was about abreast of Flattery. Two days later, a man walking along the beach near

Victoria stumbled over the body of a beautiful girl, drowned. On turning the body over, he discovered the face of Fanny Palmer, whose folks lived on the bluff just above. But, Fanny Palmer? He had seen her go aboard the Pacific the day before—how then had her body come here?

The alarm was soon spread. Searching parties found other bodies — many of them—and it soon became apparent that the Pacific Northwest was facing the worst marine catastrophe in its history. It was not until the morning of the eighth, when the revenue cutter, Wolcott, picked up Neil Henley that the distracted people of Victoria heard the story of this marine horror.

● Neil Henley's Tale

Here is Henley's story at the time, as quoted in Lewis and Dryden's "Marine History of the Pacific Northwest":

"I was off watch, and went below at 8:00 o'clock, and about 10:00 p.m. was awakened by a crash, and getting out of my bunk found the water rushing into the hold at a furious rate. On reaching the deck, all was confusion. I looked on the starboard beam and saw a large vessel under sail, which they said had struck the steamer. When I first distinguished her she was showing a green light. The captain and officers of the steamer were trying to lower the boats, but the passengers crowded in against their commands, making their efforts useless. There were fifteen women and six men in the boat with me, but she struck the ship and filled instantly, and when I came up I caught hold of a skylight which soon capsized. I then swam to a part of the hurricane deck, which had eight persons clinging to it. When I looked around, the steamer had disappeared leaving a floating mass of human beings, whose cries and screams were awful to hear and the sight of which can never be effaced from my memory. In a little while it was all over; the cries had ceased, and we were alone on the raft, which was the part of the deck on which was the wheelhouse. Besides myself, the raft supported the captain, second mate, cook and four passengers, one of them a young lady. At 1:00 a.m. the sea was making a clean break over the raft. At 4:00 a.m. a heavy sea washed over us, carrying away the captain, second mate, the lady and another passenger, leaving four of us on the raft. At 9:00 a.m. the cook died and rolled off into the sea. At 4:00 p.m., the mist cleared away, and we saw land about 15 miles off. We also saw a piece of wreckage with two men on it. At 5:00 p.m. another man expired, and early the next morning the other died, leaving me alone. Soon after the death of the last man I caught a floating box and dragged it on the raft. It kept the wind off, and during the day I slept considerable. Early on the morning of the eighth I was rescued by the revenue cutter, Wolcott."

The only other survivor, a passenger, Henry F. Jelley, gave a very incoherent account full of conflicting statements. As to the exact truth of what caused this tragedy, we have two official statements, both of which are quoted by Lewis and Dryden.

● Coroner's Jury

First the coroner's jury statement:

"That the said steamer, Pacific, sank after a collision with the American ship Orpheus, off Cape Flattery, on the night of November 4, 1875; that the said Pacific struck the Orpheus on the starboard side with her stem a very light blow, the shock of which should not have damaged the Pacific if she had been a sound and substantial vessel; that the collision between them was caused by the Orpheus not keeping the approaching Pacific's light on her port bow as when first seen, but putting the helm hard to starboard, and unjustifiably crossing the Pacific's bow; that the watch at the time of the wreck on the Pacific was not on the lookout, the third mate, a young man of doubtful experience; that the Pacific had about 238 passengers on board at the time of the collision; that she had five boats, the utmost carrying capacity of which did not exceed 160 persons; that the boats were not and could not be lowered by the undisciplined and inexperienced crew; that the captain of the Orpheus sailed away, after the collision, and did not remain near the Pacific to ascertain the damage she had sustained."

● Captain Sawyer's Statement.

Second is the statement of Captain Charles A. Sawyer, of the ship Orpheus, commenting on the coroner's jury verdict:

"The Orpheus was steering about north, keeping close in to the land, with the wind from the southward and blowing fresh with fine rain, the ship going about 12 knots. Her head yards were braced sharp up by the starboard braces, her main and after yards square, thus leaving the ship in such a position that she could be hauled off shore on a moment's notice, if anything came in view. At 9:30 p.m. I had left the deck in charge of a second mate—Allen, I think his name was—with orders if he saw anything, to starboard the wheel, and keep her head to the northwest off shore. I went below to consult the chart and had just seated myself at the table in my cabin, looking at the chart, when I heard the second mate tell the man at the wheel to starboard his helm. I looked up at the compass over my head and saw the ship's head was rapidly coming up toward the northwest. I im-

Victoria, B. C., in the days when that city was the chief port of the Pacific northwest.

mediately went on deck and asked the officer what was the matter, and he said there was a light on the port bow; said it was the Flattery light. I told him it was impossible to have the Flattery light on that bow and just then I saw a light on the starboard bow. I let the ship come up into the wind until she headed to the southward of west, and after sails aback. My ship was now comparatively at a standstill, in just such a position as I would be if I were going to take a pilot on board. This brought the steamer's light a little forward the starboard beam. I stood looking at her, with my glasses. I did not think there was going to be a collision, but, as I looked and saw no change in the course of the steamer, I said to the second mate—"She will be into us", though I did not then think she would, for I thought she would see us and keep off. I made up my mind that she would hit us, and shortly afterward she blew her whistle and immediately struck us on the starboard side in the wake of the main hatch. The blow was a light one. She had evidently stopped her engines and was backing and gave us a glancing blow, for she bounded off, and again struck us at the main topmast back stays, breaking the chain plates. She then bounded off and struck us at the mizzen topmast chain plates, carrying away the back stays and bumpkin, main and main topsail braces, leaving me comparatively a wreck on the starboard side. Before she blew her whistle, my wife came on deck and stood by my side. We could see her deck plainly from the pilot house to her bows, and not a soul was to be seen there as she passed the stern. I hailed her and asked her to stand by me, but she made no reply. My wife attempted to jump on board of her, and would, had I not grabbed her. We drifted apart, and I gave my attention to my ship and gave orders to the mate to cut the lashings on the boats and to the carpenter to sound the pumps. My rail was broken from the fore rigging to the main rigging. The first report that the carpenter made was that the ship was half full of water. I told him to take a light and go down the fore hatch, and see. In the meantime I found there was no water in the hold. I then gave orders to the mate to never mind the boats, but to take all hands and secure the back stays and repair damages. All my starboard braces had been carried away with the blocks, etc. Now, while I was attending to the condition of the ship, it certainly took from 10 to 15 minutes, and during that time I never looked after the steamer, neither did anyone else that I know of. We were all busy attending to our own necessities. When, after I found I was not seriously damaged I looked for the steamer, I just saw a light on our starboard quarter, and when I looked again it was gone. There has been a great deal said about the crying and screaming of the women and children on the steamer. Not a sound was heard from her by any one on my ship, neither was any one seen on board of her. Neither did any one on my ship think for a moment that any injury of any kind had happened to the steamer, for at 1:30 that night, as the sailors were furling the spanker, they commenced to growl as sailors will, about the steamer, after running us down, to go off and leave us in that shape, without stopping to inquire whether we were injured or not."

After repairing her damage, ship Orpheus proceeded on her way, but a few hours later stranded on the west coast of Vancouver Island near Cape Beale and became a total loss.

The New Tug Turecamo Boys

Latest Work Boat for New York Harbor Powered with 600 H.P. Winton Diesel

The B. Turecamo Contracting Company, Brooklyn, New York, placed their first Winton-Diesel workboat, Turecamo GIRLS, in service some three years ago. Since that time this boat has distinguished itself by its outstanding performance and economy in operation. The owners will shortly place in service their second Winton-powered towboat, the Turecamo BOYS, a duplicate of the Turecamo GIRLS. The new tug, 93 feet in length, was designed by Merritt Demarest and is being built by the Rice Bros. Shipyards, Boothbay, Maine. It is powered with a six-cylinder Winton-Diesel engine developing 600 brake horsepower at 250 revolutions per minute.

Power installations of this kind are now commanding the attention of workboat operators all over the country, because of the low operating costs secured. Winton is a leader in this field and the company has to its credit a large number of similar diesel power applications.

New Winton-Diesel powered tug Turecamo Boys.

Pacific—International Trade

Some Notes and Comments Culled from Publications of the Bureau of Foreign and Domestic Commerce of the U.S. Department of Commerce and from Other Sources

Chile. Some time back, the Pacific Marine Review editorial pages carried a suggestion that the United States might easily arrange a reciprocal treaty with Chile, whereby such heavy durable manufactures as American ships, American locomotives, or American cars could be exchanged for Chilean nitrate. This has already been accomplished, and the U. S. foreign trade gentlemen in Washington may strike the suggestion off their long list. The only bad feature of the accomplishment is that the arrangement is between Chile and Denmark, and the Danish workmen will be the beneficiaries. Danish shipyards will construct three merchant vessels for a Chilean shipping firm, and receive in payment approximately $2,400,000 worth of nitrate. The normal Danish import of Chilean nitrate is around 38,000 tons, worth approximately $1,300,000. The United States normally takes from 25 to 40 times that amount. Perhaps, unless Germany beats us to it, we can still make good on the other suggestion to sell some ships to Brazil, taking coffee in payment.

PACIFIC COAST FOREIGN TRADE

Month of April

	Exports		Imports	
Customs Districts	1936	1935	1936	1935
San Francisco	$ 6,092,426	$ 6,335,671	$ 7,905,022	$ 5,866,470
Los Angeles	8,027,980	5,205,236	5,928,987	3,454,449
San Diego	294,196	392,349	162,806	191,686
Total California	$14,414,602	$11,933,256	$13.996,815	$ 9,512,605
Oregon	1,437,711	872,977	1,178,292	819,802
Washington	5,486,584	3,755,205	3,031,068	2,226,579
Total Pacific Coast	$21,338,897	$16,561,438	$18,206,175	$12,558,986

Four Months Ending April

	Exports		Imports	
Customs Districts	1936	1935	1936	1935
San Francisco	$29,164,482	$30,141,345	$29,671,402	$25.793,128
Los Angeles	30,513,241	30,347,446	23,189,000	13,570,499
San Diego	1,504,971	1,516,471	1,184,814	654,094
Total California	$61,182,694	$62,005,262	$54,045,216	$40,017,721
Oregon	6,242,279	6,119,342	3,151,753	2,453,579
Washington	20,193,250	18,119,567	12,122,979	8,553,960
Total Pacific Coast	$87,618,223	$86,244,171	$69,319,948	$51,025,260

As of May 20, 1936, the United States Department of Commerce has been informed by cable from Commercial Attache Merwin L. Bohan, at Santiago, that the Chilean Exchange Control Commission has ruled orally that no exchange of any sort will be granted for the importation of automobiles and radios. The ruling does not apply to importations from countries with which Chile has compensation agreements.

Apparently the ruling has been extended to include all articles of luxury, but this term has not yet been defined.

The 600 B.H.P. Winton-Diesel as installed in the new tug Turecamo Boys, described and illustrated on the facing page.

Peru continues in a satisfactory state of development with greatly improved agricultural conditions.

With funds derived from an added tax on cigarettes, the Peruvian government is financing a chain of popular restaurants to aid in feeding the poor. The plan calls for eight of these eating places in Lima, two in Callao, and one in each of several neighboring towns. As of May 1, four were in operation and proving very popular. A substantial concrete building, with tile floors, equipped with high class service of non-breakable, rustless materials, fitted with American modern refrigerators, and American aluminum steam kettles, to take care of 600 at one sitting, is supplied for each restaurant. The meals are of much higher quality and less costly than the laboring classes could prepare in their own houses.

Radio is installed with loud speakers, and an athletic department, fitted with most modern and sanitary showers, lavatories, and swimming pool.

These establishments are administered by the government and are open from 11 a. m. to 2 p. m. and from 6 p. m. to 9 p. m. Sample menu of four-course meal: a soup, a meat and vegetable stew, a fish plate, a pudding, bread, tea or coffee—price the equivalent of 8 cents United States currency . . . all out of a surtax on cigarettes.

Peru produced over 11 million barrels of crude oil in 1935, of which nearly 10 million barrels were exported as crude, the balance being refined locally for local consumption. Of motor and aviation gasoline, Peru used nearly 19 million gallons in 1935, as compared with 15.6 million in 1934—an increase of nearly 20 per cent. This increase is due to the increase in the use of automobiles and airplanes for transport in Peru and among her neighbors.

Colombia. Colombia consumes annually approximately 40,000 metric tons of sugar, and produces approximately 30,000 metric tons. On account of this discrepancy, the government recently voted to continue the policy of importing sugar, duty free, to be marked by the sugar cartel at a fixed price. The sugar cartel estimates that this year's sugar import requirement will approximate 11,000 metric tons. Not more than 4500 tons will be allowed in during any one month.

Scadta Air Lines, serving Colombia, declared a 10 per cent dividend out of 1935 earnings, after issuing a remarkable report showing 22,505 passengers carried—an increase of 125 per cent over 1934; 1,669,664 kilometers flown—an increase of 28 per cent over 1934; 4,658 flights—an increase of 35 per cent; mail carried, 38,084 kilograms—an increase of 23 per cent; and a total pay load of 2,049,098 kilograms—an increase of almost 100 per cent. The dividend was taken out after making considerable improvements in ground equipment and airports, augmenting the fleet of planes, establishing new routes and otherwise expanding services, setting aside substantial amounts for legal reserves, insurance reserves for planes and additional funds for retirements and discharge indemnities for employees.

There is quite an activity in residential, commercial, and government building construction, and this offers a very large outlet in building hardware and equipment. Unfortunately, American exporters are handicapped by the exchange situation, which gives German exporters a differential of nearly 30 per cent.

Mexico. Business conditions are reported very good, with marked improvement in such items as automobile accessories, hardware, and industrial machinery.

Regardless of the approach of the rainy season, the wholesale movement into various sections of the Republic is holding up extremely well and, in general, industrial activity has not been reduced in anticipation of a slackening demand. In some lines prices have substantially increased as a result of higher labor costs with a resultant decrease in sales, but, on many products additional costs have been absorbed partially or entirely by manufacturers or retailers and consumption has increased.

Considering the average for 1929 as 100, the wholesale price index increased from 84.83 in March, 1935, to 94.6 in March, 1936. While industrial loans are being restricted, banks are making loans to companies which can demonstrate repayment in short periods.

Mexican woolen textile mills are working two shifts in some departments and three shifts in others in order to supply the demand for fabrics. Cotton textile mills are operating on an average of two shifts a day and are experiencing a good demand. Increasing construction activity is keeping cement and steel production at high levels with the immediate future promising.

Australia threw somewhat of a bombshell into the camp of American exporters with an embargo, effective May 23, against a list of 80 American products. This is an effort to force a balance of trade, and was brought about by the conditions existing now for some years in the exchange of products between Australia and the United States. This current report shows that we buy one dollar's worth from Australia, while she is buying three dollars' worth from us.

A memorandum issued by the Australian customs authorities on May 28 provides admission permits on all goods ordered on or before May 21, and in transit on or before June 30. On imports of motor vehicle chasses permits will be apportioned among importers for the year ending April 30, 1937, to the extent of the number imported during the year ending April 30, 1946.

The outer harbor terminals of the Port of Oakland on San Francisco Bay handle a large share of the foreign trade of that busy port.

Veteran Steamboatmen's Association Meet

U.S.S. Shubrick, first lighthouse tender on Pacific coast.

Eleventh Annual Reunion Pays Tribute to the Lighthouse Service and to the First Pacific Coast Lighthouse Tender

The history of early navigation on the rivers and lakes of the Pacific coast is replete with romantic as well as technical interest. This year, 1936, marks the end of a century of steam navigation in these waters, since it was on May 16, 1836, that steam was gotten up in the boilers of the famous Hudson Bay Company's old side-wheeler, Beaver, at Fort Vancouver for a test run on the Columbia. The history of these early pioneering efforts is being kept alive by the Veteran Steamboatmen's Association of the west with headquarters at Portland, Oregon. This association holds an annual reunion and picnic, usually held at some historic stop on the Columbia river system. This year it is to be at Bonneville on June 28. In the announcement and dedication of this reunion, high tribute is paid to the U. S. Lighthouse Service, and to its first tender, U.S. S. Shubrick. Captain Frank J. Smith, historian to the association, has made this year's announcement a valuable historical booklet by producing a very comprehensive and accurate account of the careers of the Shubrick and the Beaver. Here follows the dedication and the history of these two vessels:

● Dedication

It is entirely fitting that we, the Veteran Steamboatmen of the Northwest should dedicate our eleventh annual reunion in honor of the United States Lighthouse Service.

From the first time that men went down to the sea in ships and pitted their strength and cunning against nature's most fickle of elements, the light on shore has sent its beam of encouragement, comfort and aid to guide them in their peril.

Since the evening of September 14, 1716, when the feeble beam from the crude oil lamp of the first lighthouse on the American continent felt its way through the darkness of Boston Harbor, the history of the Lighthouse Service has been a romance of unselfish sacrifice, a saga of men who labored that others might live.

The United States Lighthouse Service is the oldest Technical branch of our Federal Government, it having been established by act of the first Congress of the United States in 1789, one hundred forty-seven years ago.

In paying tribute to the first Steam Lighthouse Tender and the first Lighthouse Tender on the Pacific Coast, we honor the United States Lighthouse Service and the ideals for which it stands.

Early in 1858 the United States Steamer Shubrick arrived on Puget Sound and commenced a career of usefulness in the Government Service, which kept her name prominently before the public for thirty years. She came from the East to San Francisco in charge of Inspector DeCamp and Captain J. Harris, with J. M. Frazer, first officer. The Shubrick was the first lighthouse tender on the Pacific Coast, although she was called a revenue cutter when she made her appearance in 1859.

She was built in Philadelphia in 1857 of live and white oak, copper fastened throughout, was brigantine rigged and mounted three cannon. Her dimensions were: length, one hundred and forty feet; beam, twenty-two feet; depth, nine feet; engine (single) fifty by forty-eight inches. On her first trip to the sound, Captain Frank West took command, having been appointed by Captain John DeCamp, at that time Lighthouse Inspector for this district.

Late in June, 1859, seventy-seven years ago, the Shubrick made a cruise to the Cascades with a number of army officers from Vancouver Barracks, headed by General Harvey, reaching Ruckels' Landing, now known as Bonneville, making the first journey that far inland for an ocean-going steam vessel although this feat was duplicated by the Brig Henry, an ocean-going sailing vessel that had recently arrived from the Atlantic Coast. This vessel landed at a point opposite and near the village of North Bonneville in July, 1851, just eighty-five years ago and while anniversaries are mentioned it may be proper to note that the Columbia, the first Oregon steamboat, made her landings for the first time in the summer of 1850, eighty-six years ago.

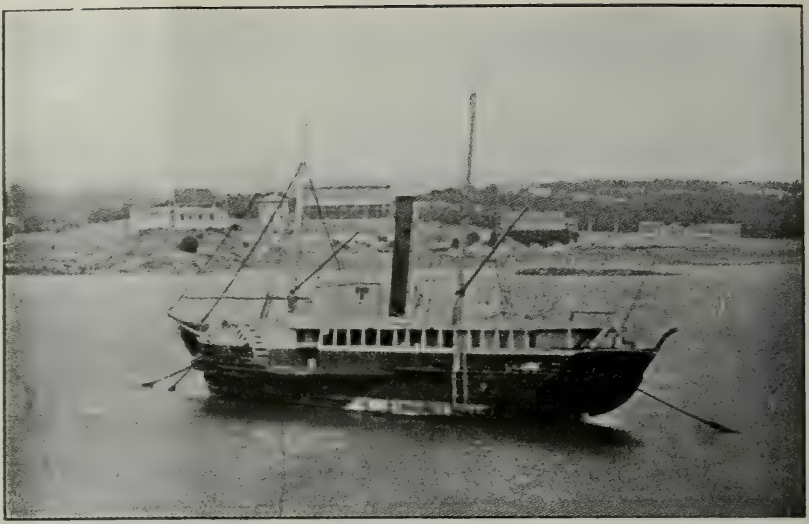
During the early part of her career, when local steamers were scarce, the Shubrick often in addition to her revenue duties carried freight and passengers and performed many other necessary duties. The Shubrick with other United States vessels performed guard duty at one time at the wedding of a pioneer steamboat owner of Portland. This doughty little vessel, with the Active, the Jeff Davis and Massachusetts were stationed at San Juan Island in 1859 as an offset for the same number of British vessels during the unpleasantness caused by the northern boundary question. While she was there, Jacob Kamm, a well-known pioneer of Portland made a hurried trip to Fort Hope, near by, for the purpose of becoming wedded to Miss Caroline Gray, who was visiting at that Canadian village. Owing to the Canadian law the obtaining of a marriage license was not possible at once, and an ocean wedding was decided upon. The Shubrick and her consorts acting as escort.

After over a quarter of century of continuous work in the Northwest, the Shubrick made her last trip in 1885, and was taken to Mare Island Navy Yard, California, and sold at auction March 20, 1886, after approximately thirty years of strenuous sea and inland service.

● The Old Steamer Beaver

There is a tinge of half forgotten romance like the scent of an old-fashioned garden woven through the history of the prosaic old hulks which plowed Northwestern waters in the early days. Hulks which have finished their task of serving a pioneer country passed out of existence so long ago that even their memory is hazy and the historian is hard put to find accurate information concerning them.

But thanks to a kindly providence and the foresight of her builders, there is one vessel whose name and fame will last as long as steam or sail shall plow the shining waters of the Pacific.



An interesting view from an old photo of the Beaver, pioneer steamer of the Pacific Ocean.

"The Old Steamer Beaver," as she was called, was the first steamship that entered the waters of the Pacific Ocean. For half a century before her tragic end on the rocks at the entrance of Burrads Inlet the original Beaver serenely followed her vocation with timbers as staunch and sound as on the day she was launched. During these years magnificent ocean liners and the freight steamers of nearly every nation on the face of the earth came to churn the waters of the northern seas, and thousands of lesser craft steamed in and out of the navigable streams of the Northwest.

The Beaver was built in England, at Blackwall, County of Middlesex on the Thames River, May 7, 1835, by the ship-building firm of Green, Wagram & Green. Her length was 101.4 feet; beam, 20 feet; depth, 11 feet; and tonnage 109.12. The engines and boilers were built by Bolton & Watt.

It is safe to say that no vessel until, in our own times, the modern vessels of the Queen Mary type were designed, attracted anywhere the attention that did this pioneer of the Pacific. From the day that her keel was laid until she went down the English Channel and disappeared from sight on the trackless ocean, she was watched with the closest interest.

Over 150,000 people, including King William IV, and a large number of the nobility of England, witnessed her launching and cheers from thousands answered the farewell salute of her guns as she sailed away for a then new world.

But little was known about steam marine navigation at that period, and the far off Pacific Northwest was even more of a mystery, consequently much speculation was indulged in as to the success of the cruise.

Her machinery was placed in position by her builders, but the sidewheels were not attached for her voyage to the new world. She was rigged as a brig and started her destination under canvas, with Captain Home in command.

The bark Columbia sailed with her as consort, but the Beaver was too speedy, and reached the Columbia in

Throughout the active career of the Beaver there were few harbors on the Pacific Coast and practically no breakwaters. Scenes like this were common after each heavy storm.

advance of her companion after a passage of 163 days.

She arrived at Fort Vancouver on Monday, April 10, 1836, and dropped her anchor at 7:30 p. m., with her consort, the Columbia.

On Monday, May 16, the carpenters placed the wheels on her shaft and at 4:00 p. m. the engineers got up steam, tried her engines and found them working well. After a trip in search of firewood on May 31, a party from the Fort came on board and they steamed down and entered the upper branch of the "Wilhammut", now the main entrance of the Willamette River into the Columbia, from there ran, "at half power," down the present Multnomah Channel to where St. Helens now is and up the Columbia to Vancouver. At the end of this memorable day the ancient custom ever since the advent of water craft, with the possible exception of Noah's Ark, was duly observed, with this note in the log book: "At eight called all hands to splice the main brace." This meant that all hands were served with "grog", a refreshment, the potency of which can only be guessed at.

On June 11, the steam being up, they hove short; tightened up her cable until she was almost perpendicular over her anchor and received another party of excursionists and ran down the river entering the lower branch of the "Wilhammut" or the Multnomah Channel at St. Helens, went up this artery to the Willamette and reaching the Columbia arrived back in Vancouver.

On June 19 she left Vancouver for her first sea voyage under steam and that evening reached Pillar Rock, taking aboard Duncan Finlayson, Chief Factor.

On the night of June 26 she crossed the bar at the mouth of the Columbia and the great ocean of the Pacific heard for the first time in the pipe of her puny whistle, the challenge of steam, steam which in the space of only a few years would span her farthest reaches and defy her wildest gales. Old Ocean took up the challenge at once for before midnight the Beaver's log tells us that the planking in the deck cabins began giving way in a cross sea. On the 27th the after part of the starboard paddle-box carried away and with cross seas, and shortage of wood she again resorted to her sails and finally reached Tungase and was in Russian territory on July 14.

The Beaver had a strenuous life of 53 years for it was not until July, 1888, that she succumbed to the inevitable when she was swept on the rocks near the entrance of Vancouver harbor. When it became apparent that the first steamer which ever plowed the waters of the Pacific was in a fair way to be lost forever, a strong effort was made to preserve her.

A company was formed for the purpose of raising her and repairing her, and taking her to the World's Fair at Chicago, but the tardy recognition of her worth as in the case of many human makers of history, came too late. About the time the company was ready to place her again in her element, the big side-wheeler Yosemite came sweeping by at high tide, throwing a swell which lifted the Beaver and she sank to the deep water abreast the rocks.

Thousands of relics were salvaged from large pieces of her frames, to make canes, gavels, picture frames and other similar mementos, which have been scattered to the most remote quarters of the world. The copper bolts and sheathing were melted into medals, and, with the wooden relics will serve to keep the memory of the Beaver fresh long after that of her palatial successors has vanished.

American ships of the type of the Henry B. Hyde, shown here shortening sail after the famous painting by Chas. R. Patterson carried the bulk of American foreign commerce during the career of the S.S. Beaver.

Synchronized Signaling

A Modern Aid to Safe Navigation as Developed and Installed by the Lighthouse Service on the Coasts of the United States

Every seafarer must have had occasion to observe the lapse of time between seeing the jet of steam escaping from a steamer's whistle and hearing the sound, when the vessel is at any considerable distance. Another example of the same natural law is the lapse of time between seeing a stroke of lightning and hearing the sound of the thunder, the difference in transmission time between light and sound giving in either case a measure of the distance of the source.

The availability of radio in marine signaling work has opened a field for the application of the same general principle in the advancement of the safety of navigation, by arrangement for the simultaneous emission from lighthouses and lightships of radio signals, the transmission of which is practically instantaneous, and of sound signals which travel at measurably slower rates. Several applications of this principle to aids to navigation have been made in recent years.

Sound signals of many kinds as aids to navigation have long been used for assistance to the mariner when visibility is reduced by fog, snow, etc., but they have always suffered limitation in their effectiveness from two classes of uncertainty on the part of the hearer—namely, direction and distance. Efforts made to provide a means of determining direction led to the development of apparatus for sending and receiving underwater signals. Such signals, in addition to being susceptible of a rough determination as to direction, are free from the effect of variable atmospheric conditions, though apparently subject to somewhat related irregularities affecting water transmission.

The advent of radio as an instrument of marine signaling has had important effects upon the problem of sound signaling, although rather as a supplement to, than as a replacement of sound signals, which may be expected to continue to be an essential element of marine signaling of very widespread use. The range of radio signals is vastly superior to that of all types of sound signals and their direction is determinable with a degree of accuracy which has led to their extensive introduction and widespread use, notwithstanding the necessity for the use of special receiving apparatus upon vessels. The directional uncertainty with respect to fog signals appears to have been overcome with a high degree of success therefore by the use of radio, and the progressive equipment of vessels with the radio direction-finder leads to increasingly active study of the problem of distance determination by synchronous signaling.

The method of synchronous signaling has been applied to about 34 stations using underwater signals synchronized with radio signals. This method, however, requires the use of special receiving apparatus for the receipt of the under-water signals as well as for the receipt of the radio signals, and this fact may account, at least in part, for the slow progress which has been evidenced in the advance of this method during the years when economic conditions have borne heavily on the world's shipping. Another factor adversely affecting the general adoption of this method is the limited number of stations to which it is efficiently applicable. Its use has been largely centered in the Baltic and North Sea areas.

A method of synchronous signaling has been developed in Scotland which is of much interest. It uses the radio-telephone broadcast of the speaking voice as recorded on phonograph records, synchronized with air fog signals, thus giving a spoken identification of the sending station and also speech-counting in miles and cables or tenths of miles. The distance away from the beacon or broadcasting source is the distance heard by radio coincident with the end of three blasts of the air fog signal heard through the air.

This method has the advantage of very ready and unmistakable understanding of the distance determination, but appears open to the objection of requiring, at least in the present state of the art, so wide a frequency band that any considerable number of such installations within a limited area might introduce a serious interference problem.

In the Lighthouse Service of this country, after a number of years of study, experiment, and trial, synchronous signalling is being rapidly extended to all suitably located and equipped stations which emit both radio and air sound signals. At nearly all such stations the cost of such action is small, consisting merely of the replacement of independent timing devices heretofore controlling the characteristics of the sound signals and the radio signals by signal timers designed to keep both signals in constant synchronism. Moreover, no special apparatus is required on the vessel making use of this added facility, although a stopwatch or clock with specially graduated dial is a convenience.

Among the factors worthy of consideration in respect to adoption of this application of the general principle of synchronous signalling, may be mentioned:

1. Its general applicability to many stations both ashore and afloat, especially in localities requiring close navigation.

2. Its extensive availability to shipping without need for special receiving apparatus other than already available or being generally adopted for other needs, namely, radio receiving apparatus, including direction finders.

3. The increased dependability of sound signals through a reduction in element of uncertainty as to the distance of signal heard.

4. Simplicity of observations and accuracy of results within required limits for navigational purposes.

Its limitations are, of course, those which are inherent in the propagation of sound in air, such as variable range, zones of silence, or other effects of changing meteorological conditions. In spite of these recognized limitations, however, the method is believed from the evidence of experience up to this time to constitute a logical and practical approach to the systematic use of the synchronous method in signaling, and its general adoption and widespread use by mariners, with whatever modifications or extensions may later develop as a result of progress in the technologic arts and the practices of navigation. A number of modifications in detail or alternative methods are at present in somewhat experimental use in various countries.

Radiobeacon signals have been synchronized with air fog signals in the United States Lighthouse Service at 25 stations on the Great Lakes, 15 stations on the Pacific coast, and 16 stations on the Atlantic and Gulf coasts.

Arrangements are now being made to put this method in effect at 16 additional stations along the Atlantic coast, upon the completion of which it is planned to invite the cooperation of all radio equipped shipping in carrying out comprehensive tests on the eastern seaboard similar to those heretofore conducted on the Great Lakes and the Pacific coast.

The superintendent of the Eighteenth Lighthouse District has received the following comment from the commanding officer of a battleship of the United States Navy, regarding recent experience with the synchronized sound and radiobeacon signals at Anacapa Island and Los Angeles Breakwater:

"While en route from San Francisco to San Pedro, on April 10, this ship ran into a heavy fog about 10 miles to the northward of Point Arguello. We used the synchronized radiobeacon on Anacapa Island and on San Pedro Breakwater to excellent effect. In both instances the sound signals were picked up at a distance of about 8 miles. The accuracy of positions obtained is indicated by the fact that although the ship anchored in a dense fog off San Pedro, the position is obtained by the use of the synchronized radiobeacon proved to be but 200 yards away from the actual position as obtained by bearings after the fog lifted."

[U.S. Lighthouse Service Bulletin.]

An Epitome of American Yachts

The 34th Annual Volume of Lloyd's Register of American Yachts Lists 5700 Vessels and 654 Yacht Clubs

G. B. Laberts' beautiful sailing sloop the Yankee. Built of steel and bronze plated.

The new volume of Lloyd's Register of American Yachts (34th annual issue) shows a total of 5700 yachts of the United States and Canada, with 654 yacht clubs, and the private signals of yachtsmen to the number of 3000, with 595 club burgees. The number of yachts entered has increased by 196, with the addition of 323 new entries to compensate for yachts dropped as destroyed or obsolete. Of these new entries 130 are new this year, divided as follows: power, 46; auxiliary sail, 78; sail without power, 6. The list is interesting as showing the trend of modern yachting.

### ● Sailing Types

The sailing yachts are all small, and only two are racing craft, the 6-Metres Indian Scout and Mood. In addition an 8-Metre Yacht is building on the West Coast for Mr. William A. Bartholomae, Jr., but was not included in the Register as the owner, up to the time of press, had not decided on her name. Just what this may mean for the future of sailing yacht racing is a question for yachtsmen to study! The size of the auxiliary fleet is due in part to two new one-design classes; that of the New York Yacht Club, designed to the ocean racing rule of

All Alone, the beautiful cruising yacht of George W. Codrington, president of the Winton Engine Corporation. She is 95 feet length overall, 16 feet beam, and powered with 2 8-cylinder 5½" by 7½" Winton diesels. Her home port is Cleveland.

the Cruising Club of America by Sparkman & Stephens, Inc. and built by Henry B. Nevins, Inc.; and that of the Eastern Yacht Club, designed by Belknap & Paine, Inc. and built by George Lawley & Son Corporation. The first class, numbering 20 yachts, is of 32 feet waterline, sloop-rigged; the second, of 3 yachts, is of 36 feet waterline and cutter-rigged. The building of 23 yachts specially designed for ocean racing testifies to the popularity of this form of yachting.

The remaining yachts of the auxiliary division are mostly of the same type of cruising craft, keel yachts of good proportions, specially designed for their intended use in the many "long-distance" races now promoted by the smaller as well as the large clubs. As a class they represent a distinct advance on the semi-racing type so long popular. One feature of this class calls for special note: the growing popularity of the cutter rig. The schooner rig has always been popular in America for even the smaller cruising yachts; a very large number of this rig having been built within the past twenty years. The yawl rig has been less popular and until recent years the ketch was almost unknown. The latter rig has increased in number of recent years, in competition with the yawl, but the schooner has always been in the majority. The cutter rig is the latest to claim the attention of American cruising men, but at the present time it is being tried to an extent never before known. It is a very interesting question, as yet unsolved, as to whether a well designed cutter, with the mast stepped well amidships, double head-rig and a loose-footed mainsail, may not supplant the two-stick rigs in all yachts of moderate size.

● Power Types

The power division shows no additions to the steam fleet, a growing number of diesel installations, and an increase in what may be called the family cruising craft of moderate size, able, and with good accommodation. The largest addition to the fleet is Semloh, designed by George F. Crouch and built by Henry B. Nevins, Inc. for Mr. Jay Holmes, of 93 feet over all, equipped with three diesel engines, designed and powered for long cruises. While practically all of the new yachts are of wood construction, there is one novelty, the 40-foot launch Thorn, which is being constructed of welded steel.

● Sloop Annie Cremated

As a matter of sentiment the famous schooner America, now in her 86th year, is retained in the Register though only a historic relic; the next older was the sloop Annie, modelled by the famous Captain Bob Fish and built in 1861 for Mr. Ludlow Livingston, a member of the New York Yacht Club who then lived in a mansion on the shore of Staten Island. The old yacht, taken to San Francisco on the deck of a sailing ship sixty years ago, was in commission last season under the ownership of Dr. Emmet Risford, who had sailed her for many years. In spite of her greatly reduced rig she had become too weak for the strong breezes of San Francisco Bay, and rather than degrade her to commercial use her owner had her decently cremated last December.

The 1936 Edition of the American Yacht Register maintains the high standard the book has enjoyed for many years past, and a glance through its 620 pages will disclose much of interest to every yachtsman.

The price is $14.00, bound in blue cloth with gilt edges and $12.00, bound in yacht canvas.

Recent Marine Engineering Progress

In recent news from European hipyards, there would seem to be no lowing up in the trend toward the diesel motorship. According to reurns compiled by Lloyds register of hipping, there were under construcion in the shipyards of the world 37 merchant vessels of 100 gross ons and upward, having a total gross tonnage of 1,820,114. Of this otal 262 vessels, aggregating 1,071,623, are for diesel propulsion, and 252, aggregating 739,427, are for steam propulsion.

An analysis of these figures indicates some rather new features in the dieselization trend. A breakdown for average size of steamer and motorship gives the steamer 2,930 gross tons (and this includes the Queen Mary), while the motorship gets an average of 4,090 tons.

For vessels between 100 and 2,000 gross tons, the present world shipbuilding program has 156 steamers and 125 motorships. The bracket from 2,000 to 4,000 gross tons has 38 steamers and 17 motorships. From 4,000 to 6,000 gross tons, there are 36 steamers and 34 motorships. At the 6,000 gross ton mark the motorships assume the lead, and we find that from that mark up to 15,000 gross tons there are now building 83 motorships and 18 steamers. From 15,000 to 20,000 gross tons, there are 3 motorships and 3 steamers building, and above 20,000 there are 3 steamers and 1 motorship.

Of the 156 steamers in the 100 to 2,000 gross ton size, 56 are in British, 54 in German, and 16 in Norwegian shipyards. These steamers are mostly coal burners, and are able to compete on account of the great improvements recently perfected in coal-burning boilers and in reciprocating steam engines.

Even more striking is the diesel engine trend in Europe when we break down the figures of engine power; 644 marine engines are tabulated, with a total horsepower of 1,725,085. Of these, 235 are reciprocating steam engines which deliver 341,610 indicated horsepower, 60 are turbines accounting for 420,945 shaft horsepower, and 349 are diesel engines generating 962,530 indicated horsepower. In other words, of the power needed to propel all the seagoing vessels building in the world as of March 31, 1936, over 55 per cent is to be diesel engines.

It is very interesting to note the trend toward mechanical geared drive in Germany, where this type has become practically a universal standard for cargo vessels. At the present time there are building in Germany, for German owners, nine cargo motorships of 63,000 tons total dead weight capacity, and all of them are for geared diesel drive with hydraulic couplings, and all of the engines are of the two-stroke cycle type. The one other cargo motor vessel building for German owners is of 2,000 tons deadweight carrying capacity, and has direct connected drive.

Outside of Germany, we find the geared drive being ordered for a new Norwegian-American Line transatlantic liner, and for a large Swedish cargo vessel, the latter with electrically operated clutches in place of the hydraulic couplings.

Mechanical efficiency in diesel engines is improving. The great majority of marine diesel engines today will run at from 80 per cent to 85 per cent efficiency, and in the case of the Doxford opposed piston engines of the new type, they get tests as high as 90 per cent while driving their own scavenging blowers, but with independently driven auxiliary pumps. With pumps and blowers, independently driven Sulzer two-stroke single-acting engines approach 90 per cent.

This grand array of figures on the growth of the motorship in the world's merchant marine, and on the improvement of the marine diesel engine, must not be allowed to create the impresion that steam is dying out. In fact this motorship growth has stimulated the brain and heart of the steam engineer, and he is making tremendous progress in the improvement of steam boilers and steam engines, both reciprocating and rotary.

The notable success of the experiment with the Benson Monotube high-pressure boiler on the Hamburg-America line cargo vessel Unkermark has attracted a great deal of attention to this type of steam generator; and the especially designed plant on the S. S. Potsdam, of the same line, is giving a very good account of itself in the low-cost operation and higher earning capacity of that vessel.

A similar experiment is being made on the Dutch steamer Kertosono, an oil-burning steamer of 16,500 tons displacement, originally fitted with five Scotch marine boilers each delivering six tons of steam per hour at 200 lbs. pressure to a triple-expansion turbine driving a single screw through mechanical gearing at 90 r.p.m. on full load of 4,500 shaft horsepower. The owners, desiring to increase the speed from thirteen knots to fifteen knots, decided to install, in place of one of the Scotch boilers, a Sulzer Monotube steam generator, which was guaranteed to deliver twenty-one tons of steam per hour at 840 lbs. pressure. To use this steam, a small high-pressure back-pressure turbine was installed ahead of the existing turbine installation. The plant is said to be working with satisfactory economy and smoothness, and will be made the basis of design work for a new plant in a new ship.

Another interesting trend, particularly in Great Britain, is the return to coal and the development of mechanisms and processes to make the use of coal as automatic and as flexible as is the case with oil fuel.

A good case in point is the recently completed cross - channel steamer, Duke of York, for the Haysham-Belfast service. She is fitted with four Babcock and Wilcox water-tube boilers, each fitted with Erith-Roe mechanical stokers operated under forced draft closed stoke-hold conditions. Ships bunkers are arranged for endless belt conveying of the coal to the stoker hoppers.

The plant delivers 120,000 lbs. of steam an hour at 225 lbs. pressure when supplied with feed water at 215 degrees Fahrenheit temperature. Slack coal is used of 12,500 b.t.u. heat content.

Much thought and experimental work are being expended on the recovery of more energy from the ex-

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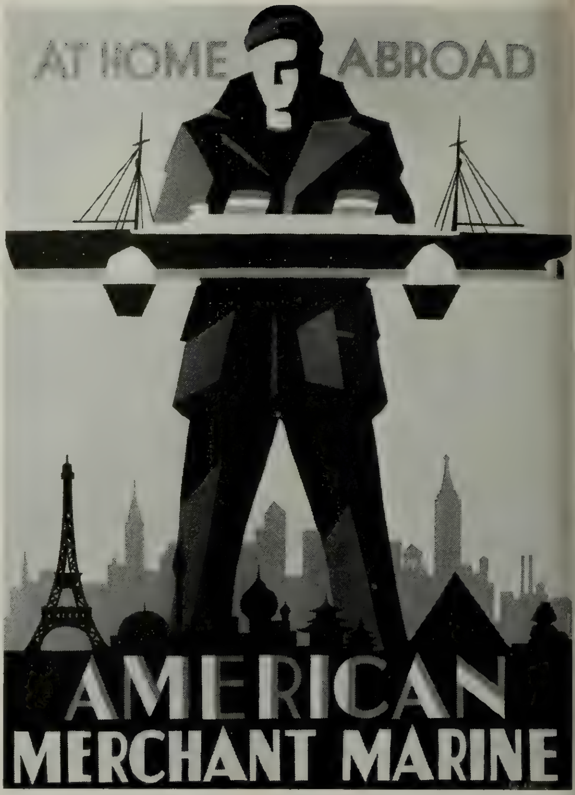
Posters and Essays

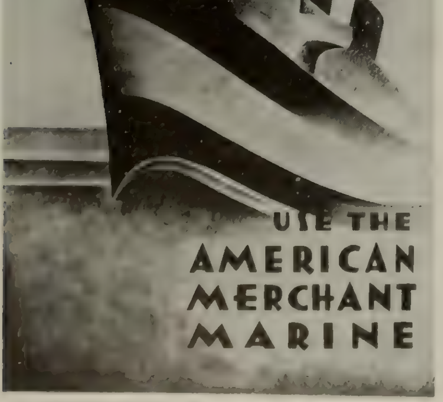
Two Interesting and Profitable Contests Sponsored by the Propeller Clubs of the United States



First prize poster, won by Sidney Rubin, Jamaica, N.Y.

Last year, for the purpose of stirring up interest in American shipping among members of the younger generation, the Propeller Club of the United States sponsored a nationwide essay contest open to high school students in every part of the country, with numerous prizes for the writers of the essays considered the best submitted. Many Propeller Club "ports," as the member branches in some forty-odd cities are called, participated with local contests and local prizes, the better essays submitted in these competitions being entered in the national contest. So great was the interest stimulated and so successful was the contest that it was a foregone conclusion that the essay contest covering some phase of the American Merchant Marine question would become an annual affair.

Arthur M. Tode, then national president of the Propeller Club, and now the organization's honorary president, accordingly appointed a committee to study the contest idea further, the primary purpose being to develop a means of broadening the scope so as to attract the largest possible number of contestants. The committee was headed by Captain J. O. Porter, former president of the Washington, D. C., Propeller Club.



Second prize poster.

The committee's report, rendered at the Ninth Annual Propeller Club Convention held in New York last November, included the recommendation that some additional activity be made the subject of a separate contest, for the purpose of interesting those high school students who might not be induced to write essays. The ship model idea was discarded for the reason that its limitations were somewhat narrow and offered little opportunity for girl students to participate. The poster contest idea appeared to offer the greatest potentialities, and the eligibility rules were extended to eliminate the high school requirement and permit boys and girls, residents of the United States, up to twenty-one years of age, to compete.

Few restrictions were imposed; posters might be in black and white, or in color, executed in any medium. The subject of the poster was to be emblematic of the American Merchant Marine.

As in the essay contest, a number of Propeller Club Ports also conducted local contests, entering the better posters in the national competition. In addition, posters were submitted direct to national headquarters from literally every part of the United States, the result of advertising and publicity directed by C. H. C. Pearsall, national president of the Propeller Club. It was required that each poster be accompanied by proof of the contestant's age.

Sixteen prizes were offered: three ocean trips in American vessels, provided by American steamship companies, and sixteen cash awards ranging from fifty dollars down to five dollars, likewise provided by operators of American vessels.

The judging committee, consisting of Philip Kappel, noted American marine artist and etcher, H. L. Boudreau, Director of Art of Pratt Institute, Brooklyn, and Herbert L. Stone, editor of "Yachting," was confronted with a task of no small proportions in selecting the best posters from the several hundred selected for their consideration. Naturally, there were many posters which could not be deemed worthy of prizes; many embodied splendid ideas but the art

PRIZE WINNERS—POSTER CONTEST
1936

Prize	Winner	Award
1st	Sidney Rubin, Jamaica Vocational H. S., 162 St. and Hillside Ave., Jamaica, N. Y.	Round Trip from New York to Haiti, Jamaica, W. I., Colombia, S. A., Panama Canal Zone, on one of the passenger ships of the Colombian Steamship Company.
2nd	Hermann K. Dahl, 544 Benninghaus Road, Baltimore, Md.	Round Trip from New York to the Panama Canal Zone, on one of the passenger ships of the Grace Line.
3rd	Robert Sherry, Jamaica Vocational H. S., 162 St. and Hillside Ave., Jamaica, N. Y.	Round Trip from New York to Galveston, Tex., via Miami, Fla., on one of the passenger ships of the Clyde-Mallory Line.
4th	William Stanke, 634 Court Street, Elizabeth, N. J.	Fifty ($50.00) Dollars Cash.
5th	Helen Swaggerty, Plant High School, Tampa, Fla.	Forty ($40.00) Dollars Cash.
6th	Frank Alger, 4818 Beach Dr., Seattle, Wash.	Thirty ($30.00) Dollars Cash.
7th	Charles Schneider, Jamaica Vocational H. S., 162 St. and Hillside Ave., Jamaica, N. Y.	Twenty-five ($25.00) Dollars Cash.
8th	Francis Sieminski, Jr., 61 Van Reypen Ave., Jersey City, N. J.	Twenty ($20.00) Dollars Cash.
9th	Bob Sheetz, 2209 H St., Vancouver, Wash.	Fifteen ($15.00) Dollars Cash.
10th	Margorie Cheadle, 7114 38th S. W., Seattle, Wash.	Ten ($10.00) Dollars Cash.
10th	Jean Cumming, 26 Grandview Avenue, White Plains, N. Y.	Ten ($10.00) Dollars Cash.
11th	Edward Warner, 1903 W. 6th St., Racine, Wis.	Five ($5.00) Dollars Cash.
11th	Joseph Torre, 236 W. 67th St., New York, N. Y.	Five ($5.00) Dollars Cash.
11th	Louis De Munzeo, 45 South 10th Avenue, Mount Vernon, N. Y.	Five ($5.00) Dollars Cash.
11th	Ellen Bradford, 653 Elgin Ave., Forest Park, Ill.	Five ($5.00) Dollars Cash.
11th	Miriam Troop, 3934 Girard Ave., Philadelphia, Pa.	Five ($5.00) Dollars Cash.
11th	Ralph Henley, Highland Street, Holden, Mass.	Five ($5.00) Dollars Cash.
11th	Gladys Wallace, 2106 General Taylor St., New Orleans, La.	Five ($5.00) Dollars Cash.
11th	Walter S. Joy, 179 Trapelo Road, Belmont, Mass.	Five ($5.00) Dollars Cash.

Third prize poster.

work was indifferent, while others were well drawn but failed to make the grade because of the absence of an idea or a slogan.

Several of those included among the prize winners were, the judges agreed, so well executed as to be worthy of favorable comparison with the work of professional artists. By the addresses of the sixteen cash prize winners, it will be noted that all parts of the United States are represented.

The response to this contest and the quality of by far the greater portion of posters submitted strongly indicates a repetition of last year's experience in the essay contest—that an interest in the American Merchant Marine can be developed on the part of the American boys and girls of today who will be the voters and taxpayers of tomorrow, provided some incentive is offered—something to stimulate the latent competitive spirit of every normal youth.

Though the 1936 poster contest has just been concluded, it is safe to say that the competition will be repeated next year.

1936 Essay Contest

A release as of June 15th from The Propeller Club of the United States indicates that the current essay contest has just been completed and on a much larger scale than that for 1935. Thousands of fine essays were submitted by boy and girl high school students throughout the country. Competition was both local and national. Each propeller club port offered prizes in a local competition, and the best essays in each local group were submitted to national headquarters. Cleveland port alone received 1500 essays. Several hundred essays were submitted direct to the national headquarters from regions where as yet no Propeller Club port has been established.

The national judges committee was composed of: Hon. Joseph B. Weaver, director of the Bureau of Navigation and Steamboat Inspection, Chairman; Rear Admiral George H. Rock, U. S. N. (retired), President of Webb Institute of Naval Architecture; and Professor T. W. Van Metre, Professor of Transportation at Columbia University. These gentlemen met in several sessions and after careful consideration of the offerings selected 19 essays whose authors were awarded the 19 trips on American ships that were offered as prizes in this contest.

It is significant that the 19 came from 15 different states, and that six of them came from Middle Western states having no salt water coast line.

Much credit is due to National President Charles H. C. Pearsall of the Propeller Clubs of the United States and to the executives of the American Steamship Lines cooperating for the success of these two very helpful and educational contests.

Book Reviews and Trade Literature

OIL ENGINES FOR ROAD, RAIL AND AIR TRANSPORT, compiled by the staffs of the "Commercial Motor," "Oil Engine" and "The Aeroplane;" 250 pages profusely illustrated; bound in buff board with black and red stampings; published by Temple Press, Ltd., London, England. Price 5/-net.

This handy volume gives a very comprehensive, world wide review of existing designs of transport engines working on the compression-ignition system. Within its neat covers is collected such a mine of information as is rarely found in a techncial publication selling at such a modest price. We understand that this is the first book covering this field, exclusively, and we would judge from its contents that it should rank as a standard reference book.

Basic principles of operation, essential details of all designs, invaluable information on comparative operation costs, and wise discussion of the features affecting maintenance are all found simply and authoritatively set forth in a book that can be carried in the coat pocket.

THE MOTOR REPAIR MANUAL. Compiled by the staff of "The Motor"; 150 pages profusely illustrated; bound in buff boards with black and red stampings; published by Temple Press, Ltd., London, England. Price 2/6, net.

This handy companion volume to "Oil Engines for Road, Rail, and Air" is a practical handbook for the amateur or the "owner-driver" on the repair, overhaul, and adjustment of an automobile, with chapters on the correct use of tools, mechanical practice and operations, equipment of a workshop, and car repairs in detail.

It is the seventh edition of a standard handbook, and gives all the information and only that information which experience has demonstrated is needed by the amateur attempting to carry out the simple maintenance and routine repairs and adjustments that lead to more satisfactory and more economical operation, and to a better understanding of the mechanism under his control.

ENGINEERING FOR NAUTICAL STUDENTS by W. A. Fisher, A. M.I., Mech. E., A.R.T.C.; 140 pages profusely illustrated and adequately indexed; bound in green buckram with gold stampings; published by Brown, Son, & Ferguson, Ltd., Glasgow; price 5/- net.

In January, 1931, the British Board of Trade included "Engineering Knowledge" in the syllabus for Examination of Candidates for the Foreign-Going Master's Certificate. In 1935, the British Central Board for the training of officers for the Merchant Marine Service included this subject in the syllabus for training of apprentices.

The volume under review covers in very simple brief fashion, the elementary engineering knowledge required by the examinations for the various grades of deck officer in the British merchant marine service. Its contents include:

Drawing and sketching simple engine parts in plan and elevation, boilers, steam engines, winches, windlasses and steering gears;

Main engines, auxiliaries, pumping arrangements, shafting and propeller, refrigeration, steam turbines and Diesel engines;

Electricity, including theory, electro magnets, dynamos, motors, heating and lighting appliances, wireless.

Trade Literature

New Oxy-Acetylene Cutting Attachment. A new oxy-acetylene cutting attachment known as the Oxweld Type CW-22 has been announced recently by The Linde Air Products Company. This attachment incorporates features of design and possesses a range and quality of performance, which permit it to handle light sheet metal as well as all but the heaviest work at speeds and efficiency equal to those of the full size cutting blowpipe. The attachment operates on low-pressure or medium-pressure acetylene, with equally satisfactory results. Severe field tests have proved its capacity, stability and endurance under all conditions.

The Type CW-22 cutting attachment can be used on either the Oxweld Type W-17 or W-22 weldin blowpipe handle, thereby greatly extending the utility of these two popular blowpipes.

Filters for Boiler Feed Water. The R. P. Adams Company's bulletin 40 describes a filter for removing oi and foreign material from condensate returns. This filter consists of a multiple arrangement of porous stone filter tubes suspended from tube sheets inside a steel shell. Condensate enters at the bottom, passes through the porous stone, and emerges at the top, perfectly clean. This design makes possible a very large filtering area in a comparatively small cubic space.

In practice, the filters are mounted with a live steam flushing connection at the top, and a drain to bilges or overboard at the bottom with bypass connections for the condensate, so that by manipulating four or five valves the filter can be thoroughly cleaned in two or three minutes.

An alum treatment of the condensate applied as the water enters the bottom of the filter coagulates the emulsified and suspended oils so that they are easily subject to filtration by the porous stone filter elements.

Seven Facts About Boiler Tubes. Bulletin T-14 of the Babcock & Wilcox Company is a 16-page illustrated brochure, explaining the effect of the manufacturing process on the quality of a boiler tube. It answers many important questions of interest to every buyer or user of boiler tubes.

The Babcock & Wilcox Integral Furnace Boiler. A 24-page booklet containing illustrations and descriptions of the design and construction of this modern boiler. Much performance data is included, together with pictures and descriptions of typical installations.

Modernization the Trend in Industry. A modernistic 8-page folder, setting forth in picture and text the advantages to industry of heat control through the use of Brown's Potentiometer Recording Pyrometers.

Model 33-D Diesel Engines. Bulletin 3300-D of Fairbanks-Morse contains 32 pages of text and pictures describing and illustrating in great detail their 33-D series of two cycle diesel engines with oil cooled piston and openhead combustion, which is built in four cylinder sizes 10½, 12, 14, 16 inches diameter — giving a power range from 250 brake horsepower up.

Parker Seamless Tubing. Bulletin No. 14 of the Parker Appliance Company gives price lists and technical data concerning Parker tubing, tube couplings, tube bends, and tube appliances and fittings.

Facts for Users of A.C. Motors. A 6-page illustrated folder of the Lincoln Electric Company giving all the essential data, dimensions, and prices of their line of Link-Weld general purpose squirrel cage induction motors.

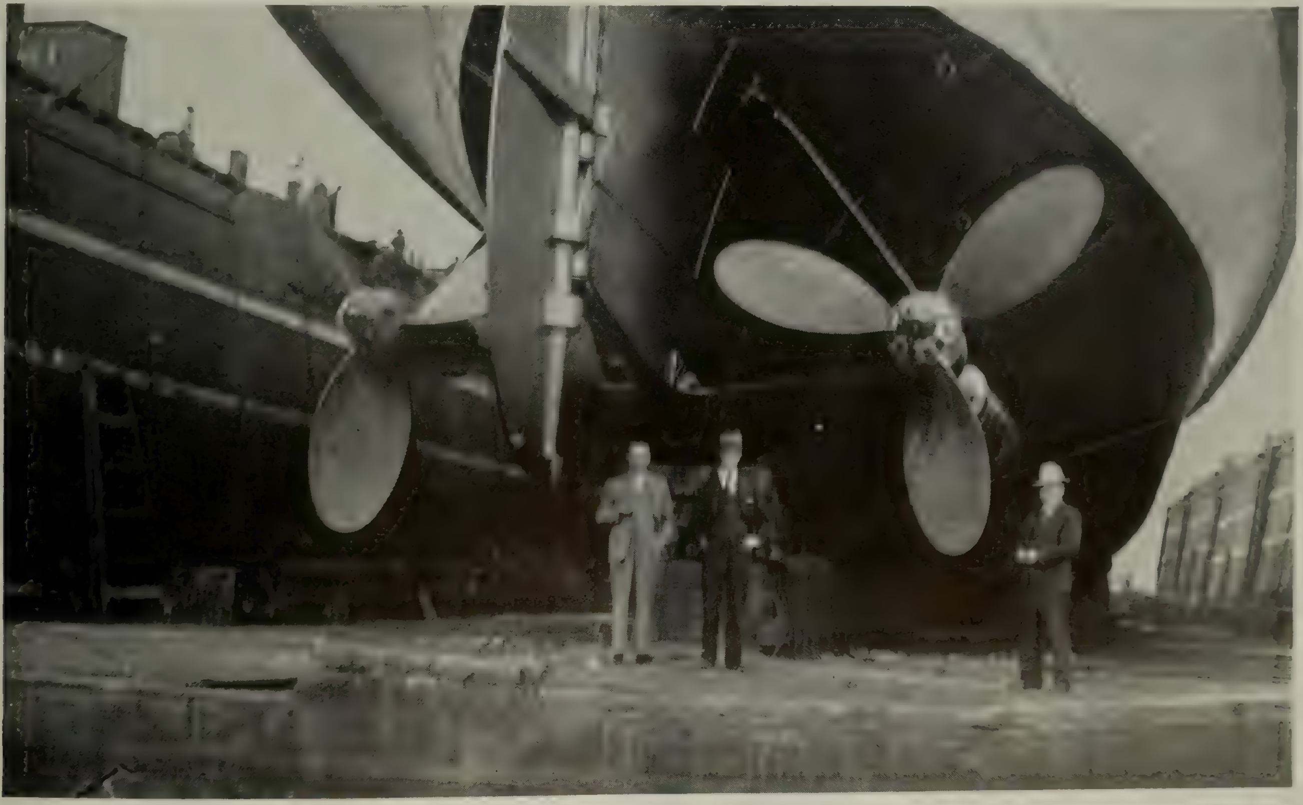
Copies of any of the above will be gladly sent on application to the Editor, Pacific Marine Review, 500 Sansome St., San Francisco.

Marine Engineering

(Continued from Page 243)

haust steam of reciprocating engines. Exhaust low-pressure turbines are used with flexible mechanical couplings, hydraulic couplings, electrical connection and chain drive, in regular commercial arrangements that can be applied with existing engine plants. Several designs of new reciprocating engine exhaust turbine combinations are available. All the foregoing apply the power generated in the turbine directly to the drive shaft. The newest idea is that evolved by a Swedish engineer named Johanson, in which the exhaust steam drives a turbine, which in turn drives a compressor in which a certain proportion of the steam from the intermediate steam chest is adiabatically compressed and returned to the intermediate cylinder with additional pressure and heat energy. On tests, this method shows savings, in heat consumption per horsepower output, of approximately 18 per cent. There is no mechanical connection and no interference with maneuvering.

Another very interesting German design is the Woolf double compound engine, especially recommended for outputs below 2,000 horsepower and with pressures around 200 pounds and super heat up to 350 degrees centigrade. The double compound has the ordinary high-pressure cylinder with a double-ported piston valve, which serves as inlet and exhaust valve for the high-pressure cylinder and inlet valve for the low-pressure cylinder. The low-pressure cylinder is on the unaflow principle, with exhaust ports at center of stroke. These engines are finding favor with coastwise and fishing vessels in the Baltic and on the North Sea. They have a remarkably good water rate at fractional loads. One concern with six steamers, ranging from 500 to 650 horsepower, had originally installed double reduction geared turbines, then changed to triple expansion, then to double compound. The latter gave 24 per cent savings in fuel bill as compared with the turbines, and 16 per cent as compared with the triples.



Stern of S.S. Catalina on dry dock at Los Angeles Shipyard. The propellers shown, designed by William Lambie of Wilmington, and cast at the foundries of the Doran Company, Seattle, were responsible for increasing the speed of this vessel from 15½ to 17 knots. Left to right: W. E. Wallenberg, Wilmington Transportation Co. executive, William Lambie, and Otto E. Lund, Chief Engineer of the S. S. Avalon.

Marine Insurance Review

Does Safety Pay in the Marine Industry

By E. T. Bullard*

It is a well known fact in industries that have tried safety work, that the safe way is the efficient way. The safe way will bring in more production per dollar spent, better work per hour of labor, and less waste than the unsafe way.

Does safety pay? Let us look at some of the industries that have been doing a real job in safety over a period of years—

Railroad—in 1916—passengers killed—246.
  Employees — 1930-1934 — average year—632.
  In 1935 — passengers killed — none.
  Employees killed—513.

Cement industry — during the past six years they have reduced accidents 75 per cent.

Petroleum industry—they have done a real job of intensive safety work that has paid real dividends in life and money saved.

Other industries such as public service corporations, and large steel industries, have taken this subject seriously and found themselves well rewarded.

Industrial accidents are too scattered to make headlines, except for a few major disasters. We all read of the terrible havoc caused by flood and tornado early this year in the east and south. The country was staggered, and rushed to the aid of these comunities. But—would we not all rise up and insist that measures be taken, if on Monday the paper should say "One thousand lives lost in industry", and again, on Thursday another headline with approximately the same figures, and again the next week the same headlines? I feel certain that both the public press and the public mind would be full of little else. Yet, in effect, this is what happens; one thousand people are killed by accidents twice a week, or over one hundred thousand per year.

Think, not only of the human suffering incurred, but also of the huge loss of income, and the great unnecessary outlay of money this makes necessary, and remember, I am speaking of fatalities only, not of injuries. To include injuries, multiply this figure by fifty, which is an estimate that for every fatality there are fifty non-fatal accidents.

We rightfully pay due reverence to the men killed in action during the world war, but do you realize that there are as many killed yearly by accidents as there were American soldiers killed during the entire world war? Yet who but the immediate families of the persons killed think of this?

So far I have been dwelling on the human side of accidents and accident prevention. This, to all of us, is to say the least, distressing, particularly if we have been connected in any way with the sufferers. However, industry and business cannot pay dividends to their stockholders on saving of humanity. Therefore let us look at the financial side of accidents. What do accidents cost, and are they worth stopping from the dollar and cents angle?

● Infections

Let us take a very simple example—infections from small cuts, those cuts that to most men are too small to bother with.

First—have you had your workmen taught the fundamentals of first aid? If not, I certainly recommend a course soon. Industry as a whole has found that for real safety work you cannot get a firmer foundation for safety mindedness in your employees than a real first aid course.

To return to infections—insurance and compensation figures show that about 250,000 small wounds each year become infected due to lack of attention. An infected wound costs from 40 to 60 per cent more than a well-cared for wound. Lost time average is eighteen weeks longer for an infection. Total annual costs are over $100,000. Loss of time approximately 4,500,000 hours, or equal to 85,737 years. About 90 per cent of all industrial injuries occur to hands and fingers.

If all workmen understood first aid and the causes of infection, just think how these figures could be reduced. These figures mean out of pocket loss to each and every one of us as every accident affects every business man either directly or indirectly.

● Fractures

In the marine industry, due to the peculiar conditions, carelessness will cause a fracture more easily than in most. A leg fracture will cost on an average $221.63, and 136 days off. Who is paying for this? You are either directly or through self-insurance, or indirectly through higher rates from your insurance carrier.

These are direct costs for the injury mentioned, but these are not the total costs to the business concern. The hidden costs that are uninsurable and must be paid for directly by the company involved are estimated to be at least four times the direct cost and include—

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*Talk before the luncheon meeting of the Propeller Club of San Francisco, May 12.

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1—Time lost from production by the injured man;
2—Time lost by other than the injured, through — curiosity, rendering assistance to the injured, sympathy, or nervous shock;
3—Slowing up temporarily of all work because — employees gather to talk over accident, or thinking of accident diverts the employee's mind, which may well lead to another accident;
4—Time lost by foreman and executives to—assist injured man; investigate cause of injury; arrange for replacement of injured worker; select, train, or break in a new employee; prepare accident reports; or attend hearing of commission or other body regarding accident;
5—Time of first aid attendant or hospital staff if employed by the company;
6—Spoilage or loss of material due to accident;
7—Damage to machine, tools, or building;
8—Loss of production due to accident;
9—Loss of productive employee's time due to temporary idleness;
10—Loss due to putting injured back on payroll when he cannot do a full day's work;
11—Loss due to inferior work done by replacement employee.

● Non-Injury Accidents

This gives you a sketch of the loss to industry where you have a lost time accident. However, to every accident causing an injury and loss of time, there are in industry, 29 accidents that result in slight injuries without loss of time except first aid treatment and there are three hundred non-injury accidents.

The non-injury accidents cause huge losses to industry—

1—Loss of time of workers and foremen in getting things going again;
2—Damage to machinery or equipment;
3—Waste of material and supplies;
4—Slowing up of production;
5—Increased hazards due to rushing the work after delay.

When figures show the indirect costs of accidents to be four times the direct cost, and when these indirect costs are non-insurable by anyone, does it not prove that real accident prevention work will pay large money dividends to those companies who are wise enough to use it?

● Safety Organization

Safety work in the past few years has emerged from the status of being a "good times" fringe of industry—one of those expenses that companies can afford only when they are making real money—the sort of expense that industry would rather pay out than to get in the surtax class on income tax. The majority of companies that have had experience in accident prevention did not curtail their safety work during the depression as they knew that such curtailment would mean increased losses due to increased accidents.

How can your safety department executive really function correctly so that you can, in turn, cash in on their efforts, not only by saving human life, but by saving the necessary dollar?

1. First and foremost, he must have the energetic and constant backing of the executives of the company starting with the president or chairman of the board. Without this you handicap the department at least 50 per cent.

2. The superintendent and foreman must be fully sold on safety work, both by the acts and by the "preachments" of their superiors.

3. The foreman must know that the company means business and that infringements of safety rules will bring discipline.

4. First aid training should be given to every employee. This training should include every one from the bottom to the top. There is nothing like the example of the "big boss" showing real interest to make a safety campaign bring results.

● Safety Equipment

Such organization is absolutely necessary for successful safety work, but, there is also another step that must be taken to insure the success of your efforts. That is, to provide the necessary and proper safety equipment for the protection of your men.

Some firms feel that safety equipment should be bought on a price basis. Cheap safety equipment is generally worse than useless, and only increases the hazard.

If you are going to protect the eyes of your men from flying objects the best goggles on the market are none too good. Goggles that do not have hardened lenses will shatter on being struck. Fine particles of glass in the eye from a broken goggle lens may cause more injury than a flying object.

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Safety belts for men over side should be of known and tested strength. A man will rely on the belt for safety and a cheap belt that will not stand the sudden jerk of a man's weight only increases the hazard.

First aid supplies should be bought with the thought in mind that each dressing should be self-contained and separate. Do not use roller bandages where the injured worker tears off part and returns the balance to the kit. The balance he returns has been contaminated by dirt and germs and will probably infect the next man that puts this bandage on an open wound.

These are just a few of the reasons for studying your hazard and then supplying to your men the best protection money can buy. The outlay is only a small percentage of the cost of an accident, that will be avoided by the proper use of the correct safety appliances.

In closing, I desire to say a few words regarding the Accident Prevention Department of the Pacific Coast waterfront employers, and shipowners, headed by Mr. Pickard.

This bureau is one of the infants in safety work, having started in 1927—just nine years ago. The first years of its existence were fairly free from labor troubles but the last two years have brought more labor trouble than we have seen for many years.

However, starting from scratch in

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1927, when in San Francisco you had six longshoremen fatalities, five in Los Angeles and on the Columbia River. During the period from 1930 to 1933, San Francisco and the Columbia River averaged two, while Los Angeles had a total of three, and during the same period it is also estimated that 23,945 injuries were prevented. This shows real tangible results for a relatively small outlay of money.

The Pacific coast is the only coastline in the world that is operating a safety department supported entirely by the industry itself, without help or assistance in any way from state or federal authorities. Speaking to you as shipowners and representatives of the marine industry, I venture to say that your own records will show you the saving this department has made for each of you, and that such savings will be in direct proportion to the backing and assistance you, individually, have given to your cooperative safety department.

Every thinking business man in San Francisco realizes the many trials and troubles your industry has been facing during the last two years. For much of this time you have had to fight your battle alone without the needed support of the business men. But I wish to leave you with the thought that this safety work will bring better public and employee relations to your industry than any other work and the value of these relations will be only a by-product of the real saving to the industry in life, limb, and dollars.

Marine Insurance Notes

Queen Mary Insurance. Hull insurance for full marine risk on the new Cunard super-liner, Queen Mary, is to be effected on a value of 4,800,000 pounds. The premium is set at 60,000 pounds net, which is said to be the largest ever paid on an individual ship. The British government will take over that amount of this insurance not covered in the open market. As of May 1, over two million pounds sterling had been taken in the London market alone, and it looks as though the government's share would not be excessive. The premium will be divided between underwriters and government in proportion to their liabilities.

The policy provides that only an amount in excess of one thousand pounds shall be paid on claims in respect to any one accident. With this exception, the document is the traditional British marine policy, as used in London for centuries, with the customary additional clauses to cover new risks.

Oldest Sailing Vessel? Denmark has a sloop, the Trelholm of Nakskov, still in full activity, which was built in 1776, and is therefore 160 years old. Can any reader tell us of an older hull than this one?

Leslie J. Haefner, Assistant Marine Secretary of the Fireman's Fund Companies, sailed from New York for London on the Berengaria on June 17 for a stay of several weeks on company business. Mr. Haefner left San Francisco in April for New York City where he has been visiting the companies' Atlantic Marine Department.

L. S. Gregory, Assistant Secretary Fireman's Fund Group fire companies, is making a business trip in three of the Rocky Mountain states. Mr. Gregory will visit company offices at Albuquerque, New Mexico; Denver, Colorado; and Helena, Montana before returning to the Head Office in San Francisco, July 6.

Fireman's Fund Appointment. Effective July 1, Raymond L. Ellis has been appointed Assistant Secretary of the Fireman's Fund Insurance Company in charge of production for the Fireman's Fund Group.

Born in San Francisco in 1895, Mr. Ellis received his education in San Francisco public schools, entering the insurance business at the age of fifteen as office boy for the former Associated Underwriters. In December, 1915, he was appointed special agent for that office, resigning in May, 1917, to enlist for service in the United States army.

Following his discharge with the rank of Second Lieutenant in the Signal Corps, Mr. Ellis became special agent for the Insurance Company of North America. In 1921, Mr. Ellis became manager of the fire department when the casualty general agency of Landis & Brickell entered the fire insurance field. Out of this connection grew the partnership of Rolph, Landis & Ellis in 1928.

Active in organization affairs, Mr. Ellis is a member of several important committees of the Board of Fire Underwriters of the Pacific, including the executive committee. He is well known throughout California as president of the California Association of Insurance General Agents. He also served as first vice president of the American Association of Insurance General Agents, and is a member of the conference committee of that organization.

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BUILDING

Progress of Construction

The following Report Contains all the Data Available Concerning the Shipbuilding Work in Progress at the Leading Shipyards of the United States as of June 1, 1936

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: Order placed for **DD400** and **DD401**, two 1500-ton destroyers for U. S. Navy; no dates set.

FELLOWS AND STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **Hull No. 647, Fellows Craft Universal**, L.B.P. 35′, beam 11′, draft 4′6″, sail area, 450 sq. ft., sloop rig; engines twin 30 horsepower, universal flexifour; keel laid November 25, 1935; estimated delivery March, 1936; 95 per cent complete March 15, 1936; delivered May 2, 1936.

Auxiliary cutter for R. S. Cooper, Burbank, Calif.; L.B.P. 43′3″; beam 12′0″; draft 6′5″; length water line 31′9″; sail area 1061 sq. ft.; motor Kermath Sea Bird; 30 h.p. motor with 2 to 1 reduction gear; propellers 3-blade Hyde feathering; keel laid Feb. 17, 1936; delivery estimated 90 days; designer John J. Alden, Boston, Mass.; delivery delayed by strike.

Two Fellows Craft 30′ stock model streamline Cruisers delivered; one to Ed Loche, Balboa, Calif.; and one to Mrs. Clara H. Young, San Francisco.

DRYDOCK, PAINT, MISCELLANEOUS: 14 yachts.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

NEW CONSTRUCTION: **2 wooden lighters, 70′x24′x6′** for Alaska Packers Association; delivered May 2, 1936.

DRYDOCK, PAINT, MISCELLANEOUS: **Barge 1922** (Union Oil Co.) Gas S. **St. Mary**, American Dredging Co., S.S. Barbara C, S.S. Lake Miraflores, S.S. Coalinga.

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Helen Whittier, S.S. Lurline, S.S. Maine, U.S.A.T. Ludington, S.S. Maui, S.S. Mauna Loa, S.S. Maunakea, S.S. President Coolidge, S.S. President Lincoln, S.S. President Garfield, S.S. Steel Navigator, M.S. Stranger.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Pt. Loma, Tug Macray, Hopper Barge No. 20, Hopper Barge No. 24, U.S.C.G. Pioneer, M.V. Velma, S.S. Tejon, Blanche W, Jimmie K, S.S. Cabrillo, Yacht Volador, L. A. Fireboat No. 3.**

THE MOORE DRYDOCK CO.
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Diana Dollar, American Star, Nerenta-k, West Planter, Mt. Baker, Samoa, Patterson, Frances, Crockett, El Aquador, Ohioan, Water Barge No. 30, Hercules, M.S. Patterson, Pennsylvanian, Iowan, Ariadne, Tug A. H. Payson, Tanker Rheems, Scotia, Redwood, Gracie S, Haviside Barge No. 5, Hawk, Santa Fe Barge No. 5.**

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: **Dom. Govt. Snagboat Essington**—Annual overhaul commenced. **M.B. Katherine B**—Docked, cleaned, painted, annual overhaul. 28 ship repair jobs not requiring docking. 29 commercial jobs.

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); LBP, 334′; beam, 35′ 1/8″; loaded draft, 10′10″; geared turbine engines; express type boilers; keel laid August 15, 1934; launched, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); LBP 334′; beam, 35′⅛″; loaded draft, 10′10″; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; launched Dec. 31, 1935.

Two 1500-ton destroyers for U. S. Navy; order placed August 21 1934: **DD392, Patterson**, keel laid July 23, 1935; and **DD393, Jarvis**, keel laid August 21, 1935, estimated completion dates, February 1, 1937 and May 1, 1937, respectively.

Construction of **Destroyer No. 408, U.S.S. Wilson** no date set.

Care and Preservation (out of Commission): **Aroostook, Jason, Kearsarge, Patoka, Pawtucket, Prometheus, Pyro.**

DRYDOCK, PAINT, MISCELLANEOUS: **Utah, Nevada, New York, Maryland, Northampton, Swallow, Mahopac, Tatnuck, Challenge, Wando.**

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Andrea Luckenbach, S.S. Lewis Luckenbach, S.S. Lake Frances, S.S. Arthur Baldwin, S.S. Otsego, S.S. General W. C. Gorgas, M.S. Northland, S.S. Depere, S.S. Point Estero.**

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith**, Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934, launched April, 1936.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery May 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154′; beam 38′; two i.h.p. Atlas engines; keel laid May 25, 1935; launched Jan. 14, 1936; delivery date not given.

Hull No. 114. One purse seine boat; 82′ L.B.P.; keel laid September 1, 1935.

IN AMERICAN SHIPYARDS

Edited by J. Suitor

Orders received for **4 purse seine fishing vessels.** Complete data next month.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges;** 132′ x 35′ x 10′; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; 25 delivered.

Six standard steel coal barges, 175′ x 26′ x 11′ for Tri-State Transportation Inc.

One derrick boat hull, 90′x30′x5′; for Halliday Sand Company, Cairo, Ill.; delivered.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hull No. 159, **Drayton (DD 366),** torpedo boat destroyer. U.S. Navy; keel laid, March 20, 1934; launched March 26, 1936; delivered June 18, 1936.

Hull No. 160, Lamson (DD 367), torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launched June 17, 1936; estimated delivery, August 13, 1936.

Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis** and **DD396 Jonett;** Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively, **DD396,** keel laid, Mar. 26, 1936. **DD394,** keel laid April 8, 1936.

Hulls Nos. 164, 165, and 166, trawlers, single screw, steel, diesel propelled, for delivery in July or August, 1936, to Boston, Mass., owners.

Hull No. 167, Ferryboat **Aquidneck.** Diesel electric ferry for U.S. Navy; estimated delivery, October, 1936.

Hull No. 168, Trawler, single screw, steel, diesel propelled, for delivery to Boston, Mass.; owners, during November, 1936.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA-39, Quincy,** 10,000 tons. Keel laid Nov. 15, 1933; launched June 19, 1935; estimated delivery May, 1936.

Heavy Cruiser CA44, Vincennes, 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD361, Clark, keel laid January 2, 1934; launched October 15, 1935; delivered May, 1936.

Large Number of Vessels Under Construction in United States Yards

An indication of the upward trend in business is the shipping now under construction in the United States, which shows a very favorable increase over that of recent years.

As of June 1, there were building in American yards 94 vessels of American Bureau of Shipping classification, with an aggregate tonnage of 134,120 tons. This building program included a large number of barges, several tankers, a few trawlers and ferryboats, one dredge, and one derrick boat. In addition to vessels of the above classification, there were also under construction 47 vessels not of A. B. S. class. These latter were comprised of barges, dredges, ferryboats, tugs, and miscellaneous smaller craft, with a total tonnage of 19,215 tons. Two fishing vessels of wood construction, aggregating 650 tons, were also building. This is a total of 143 vessels, with a gross tonnage of 153,985 tons—surely a fact to stimulate interest in our shipbuilding, and to awaken pride in the heart of every American.

Among the larger yards, mention might be made of the Bath Iron Works Corp., where 4 diesel trawlers and 1 ferryboat are being built; Bethlehem Shipbuilding Corp., whose Sparrows Point plant is building 2 oil tankers, and whose Union plant has 1 barge; Dravo Contracting Co., building 41 barges and 2 towboat hulls; and the Sun Shipbuilding and Drydock Co., building 7 oil tankers.

Most of the ships are small craft, it is true, but this does not alter the significance of the program. America is forging ahead with her ships; yards are busy, with the resultant increase of employment; and business is being secured for the country and its enterprises.

We have confidence in America and her shipping, which extends to every sea in the world, and this factor of our national prosperity will contribute greatly to a more affluent condition throughout the nation.

News of the Yards

Bath Iron Works Corporation, Bath, Maine, launched torpedo boat destroyer Lamson, on June 17, at twelve noon. Miss Frances W. Andrews was sponsor at the ceremonies, where much interest attached to the launching of the new naval ship. The Lamson is of 1,500 tons, and was built at a cost of $3,429,000.

The yard will also build a fishing trawler for the Irving Usen Company, of Boston, Mass., having been awarded the contract recently. The cost of construction was not disclosed.

Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Pa., will construct 29 standard steel riveted coal barges for the Hatfield-Campbell Creek Coal Company, of Cincinnati, Ohio. The barges will be 175 feet in length, 26 feet beam, and 11 feet deep, and will be built at an estimated cost of approximately $400,000.

Another contract for barge construction has been given the same firm, entailing eight steel riveted barges of the open hearth type. They will be built for Anderson, Clayton and Company, of New Orleans, La., and will be 195 feet in length, 35 feet beam, and 11 feet deep. Upon completion, which is expected about August 1, the barges will be used in the lower Mississippi River freight trade. No price for the work has been announced.

Matson Navigation Company is exceedingly interested in the favorable treatment accorded by congress to the new ship subsidy bill, in connection with bids submitted for construction of the two Matson freighters to be used in Hawaiian service. This action should result in the plans for these vessels taking more definite form.

Pennsylvania Shipyards, Inc., Beaumont, Texas, has been awarded a contract for construction of a 15-ton cargo derrick barge. The barge will be 99 feet in length, 30 feet beam, and 8 feet depth, and will be equipped with two diesel engines of 100 horsepower each. It will be operated on Lake Maracaibo when completed. The cost was not divulged.

The United States Engineer Office, San Francisco, received on April 28, sealed proposals for the construction of a steel hopper dredge. These proposals include the furnishing of all labor and materials and performing all work on the dredge, which will be of steel, with twin screw, and powered by a diesel engine. It will have a length of 180 feet, 38 feet beam, and a hopper capacity of 300 to 500 cubic yards of sand.

Maritime Boat & Engine Works, Inc., Seattle, Wash., through its president, F. Lepsoe, has leased the Gulowsen Grei Engine Company plant on the Lake Washington Ship Canal. The lease is for ten years, with option to purchase at any time before its expiration. In the shipbuilding and ship repair yards to be constructed on the location, there will be facilities for hauling and dry storage of 60 vessels. Work in the conversion of the plant will begin shortly.

Pusey & Jones Corporation, Wilmington, Delaware, has been awarded a contract for the construction of a tug, by the Donaldson Towing & Lighterage Company, which is operated by the Curtis Bay Towing Company, Philadelphia, Pa. The tug will be designed on the Maierform hull construction principles, and will have a length of 95 feet, beam 24 feet, and maximum draft of 12 feet. It will have a Scotch boiler, Todd oil burning system, and Skinner uniflow engine with indicated horse power of 750. Construction will be of steel, including hull guards, which are usually of wood. Model tests of the tug have been completed in the testing tank in Germany.

DD362, Moffett, keel laid, January 2, 1934; launched Dec. 11, 1935; delivered May, 1936.

DD363, Balch, keel laid, May 16, 1934; delivered June, 1936.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers** steam—425'x64'x34' for Gulf Refining Co.; total tonnage 7070 each.

CHARLESTON SHIPBUILDING & DRYDOCK CO.

Charleston, S.C.

NEW CONSTRUCTION: **One 60-ft. all-welded lighter** for stock. Rebuilt 6 lighters (wooden) for Chesapeake Corp.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Erviken, Tug Barrenfork, Tug Waban, Tug Hinton, Tug Lockwood, Tug Cecelia, Yacht Neelia, S.S. Saccarappa, Tug Congdon, Yacht Chereo, Relieflightship 109, S.S. Seven Sea Sound.**

COLLINGWOOD SHIPYARDS, LTD.

Collingwood, Ont.

S.S. Bayton, bulk freighter; owner Colonial Steamship Co., Sarnia, Ont. Docked Apr. 27, 1936. Tail shaft drawn for examination, stern bearing relined, hull caulked, odd rivets tightened up, etc.

S.S. D. B. Hanna, bulk freighter; owner—Union Transit Co., Toronto. Docked April 30, 1936. Tail shaft drawn for examination, stern bearing relined. Sundry hull repairs.

S.S. James B. Foote, bulk freighter; Union Transit Co., Toronto. Docked April 30, 1936. Tail shaft drawn for examination, stern bearing relined. Sundry hull repairs.

Tug Zelda, steel tug; John Harrison & Sons Co. Ltd., Owen Sound, Ont. Docked May 15, 1936. Tail shaft drawn for examination. Sundry hull repairs.

Tug Pinola, wooden tug; John Harrison & Sons Co. Ltd., Owen Sound, Ont. Docked May 15, 1936. Tail shaft drawn for examination, hull caulked and sundry repairs.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION: **One yacht,** L.B.P. 115', beam 17'-6", loaded draft 5'6"; speed loaded 16 miles per hour; keel laid February 15; launched October 15; delivered June 1936.

165 ft. Diesel-driven, **all steel mail boat** for U. S. Mail Service on Detroit River.

One 175'x34'x10' tender for U.S. Lighthouse Dept. Two triple expansion steam engines; total horsepower 1000; keel laid July 1, 1936; estimated delivery, February 1, 1937.

THE DRAVO CONTRACTING CO.

Engineering Works Dept.,

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hull No. 1243, 1 covered cargo barge 132' x 35' x 11' for stock, of 513 gross tons.

Hulls Nos. 1244-1245—two welded towboat hulls 145' x 32' x 6'4" for Pittsburgh Coal Co., of 600 gross tons.

Hulls Nos. 1246-1255, inclusive; 10 welded coal barges 175' x 26' x 10'8" for stock of 4720 gross tons.

Hulls Nos. 1257-1261, inclusive; five welded W-2 coal barges; 175'x26'x 10'8"; of 2360 gross tons.

Hulls Nos. 1262-1265 inclusive; four welded flush deck cargo box barges, 100'x26'x6'6"; 660 gross tons.

Hull No. 1267, 1 steel coal barge 130'x34'x4'3" for Pennsylvania Railroad Company, 530 gross tons.

Hull No. 1268, 1 steel hull for towboat, 173'x34'6"x7'2" for John W. Hubbard, Pittsburgh, Pa.; 770 gross tons.

Hulls Nos. 1269-1271 incl., 3 welded steel fuel flats, 125' x 26' x 8'; tonnage 780.

Hull Nos. 1272-1281, incl., 10 welded W-2 coal barges, 175' x 26' x 10'8".

This makes a total of 38 hulls under contract, with a total gross tonnage of 15,744.

ELECTRIC BOAT CO.

Groton, Conn.

NEW CONSTRUCTION: Hull No. 23, **Perch,** S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; launched May 9, 1936.

Hull No. 24, **Pickerel, S.S. 177** keel laid March 25, 1935; launched July 7, 1936.

Hull No. 25, **Permit,** S.S. 178, keel laid June 6, 1935; estimated launching, October 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser and DD369 Reid** for the U. S. Navy, estimated completion dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington;** keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937.

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938.

Two 12,800 tons tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; estimated completion dates October 1936 and December 1936, respectively.

MANITOWOC SHIPBUILDING CO.

Manitowoc, Wis.

NEW CONSTRUCTION: **One steel dredge hull** for U.S. Engineers.

One steel dump scow and **one steel dry dock section** for Great Lakes Dredge and Dock Co., Chicago, Ill.

MARIETTA MANUFACTURING CO.

Point Pleasant, West Virginia

NEW CONSTRUCTION: **Ten standard steel coal barges,** 175' x 26' x 11' for stock; 6 completed.

Three all-welded steel oil barges, 150'x30'x7' for export.

Two steel needle flats; 40'x14'x3'6"; for Engineers' Office, Cincinnati, Ohio.

Four all-welded oil barges; 175'x35' x8'6"; 6,000 barrel capacity each, for Standard Oil Company of New Jersey, for service on Ohio River.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION: **H 359 air craft carrier CV5, Yorktown,** for U. S. Navy; keel laid May 21, 1934; launched April 4, 1936; original contract for delivery, October 3, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; original contract for delivery February 3, 1937.

H361, light cruiser, CL47, Boise, keel laid Apr. 1, 1935; original contract for delivery, August 22, 1937.

H362, light cruiser CL49, St. Louis; estimated keel laying Sept. 7, 1936; estimated delivery, Jan. 2, 1939.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357),** launched April 18, 1936; **Hull No. 410, McDougal (DD358); Hull No. 411, Winslow (DD-359);** of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43), and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge,** Feb., 1936; **DD358, McDougal,** Apr., 1936; **DD359, Winslow,** June, 1936; **CL42, Savannah,** Aug., 1936; **CL43, Nashville,** Dec. 1936; and **CL46 Phoenix,** August 1937.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 1064 — One steel hull towboat** building for Donaldson Towing & Lightering Co., Phila., dimensions: 95' L.O.A. 88' L.B.P. x 24' x 14' 9"; one Unaflow vertical marine type engine, two cylinders 25" dia. x 20" stroke, 130 R.P.M. 600 I.H.P. One Scotch type boiler 13' 3" diam. x 11' 6" long, 3 furnaces, 185 lbs. W.P. Estimated delivery, October, 1936.

SPEDDEN SHIPBUILDING CO.

Baltimore, Md.

NEW CONSTRUCTION: **57 ft. all welded steel hull dredge tender** for Atlantic Gulf & Pacific; L.O.A. 57' 7"; beam 14' 0"; depth 7' 0"; power 140 B. H. P. Fairbanks Morse Diesel Engine.

SUN SHIPBUILDING COMPANY

Chester, Pa.

NEW CONSTRUCTION: **Hull No. 152 —steel, twin screw, truck automobile and passenger steamer** for Virginia Ferry Corporation. Length 260 ft., beam 59 ft., depth 19 ft. 1 in. 2 4-cylinder Skinner Unaflow engines — each 1400 S.H.P. 2 Foster Wheeler Water Tube boilers, cross drum sectional header type 285 pounds pressure. Estimated date of keel laying Oct. 15; launched May 18, delivered June 15, 1936.

Hulls No. 153-154—steam, single screw, steel oil tankers for Gulf Refining Company. Length between perpendiculars 425 ft., beam moulded 64 ft., depth moulded to upper deck 34 ft., loaded draft 27 ft. 6 in. Each vessel: 1 2800 S.H.P. Westinghouse cross compound double reduction geared turbine unit; 2 Foster Wheeler type A 3 drum boilers—400 pounds pressure. Estimated dates for No. 153. Keel laying Nov. 15; launched Apr. 24, 1936; delivered May 20, 1936. Estimated dates for No. 154; Keel laying November 30; launched May 2, 1936; delivered July 6, 1936.

Hulls No. 155-156. Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485'6"x68'0"x37'0"; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; launching Sept. 19, 1936; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511'x65'9"x37'; 9800 tons.

Hull No. 160, 1 oil tanker (steam) 520'x70'x40' for Atlantic Refining Co.; 18,500 tons.

TREADWELL CONSTRUCTION COMPANY

Midland and Erie, Pa.

2 15-ton whirler derrick boats 85-foot boom for U. S. Engineers, Huntington, W. Va.

1 Derrick boat for U.S. Engineers at Vicksburg, Miss.

10 Coal Barges, 175'x26'x11', for Pittsburgh Coal Co.

1 steel gold dredge (ladder type) **hull** 155'x70'x13' for South American firm.

UNITED DRYDOCKS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION: **DD364, Destroyer Mahan,** keel laid June 12, 1934; launched October 15, 1935; completed July 1, 1936.

DD365, Destroyer Cummings, L.B.P. 334'; beam 35'; mean draft 10'10"; keel laid June 26, 1934; launched Dec. 11, 1935; estimated delivery Aug. 1, 1936.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched April 18, 1936; estimated delivery indefinite.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched June 2, 1936; delivery indefinite.

Hulls Nos. 840, 841, and 842: three ferry boats for City of New York; 267' overall, 66' extreme breadth, 19'9" depth; keels laid April 4, April 27, and May 1, 1936, respectively, estimated launching, November 17, December 8, and December 29, 1936, respectively, estimated delivery, January 19, Feb. 9, and March 2, 1937, respectively.

UNITED STATES NAVY YARD

Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case,** L.B.P. 334'; beam 35'; keel laid, Sept 19, 1934; launched Sept. 14, 1935, estimated delivery

September, 1936.

Destroyer DD371, Conyngham, L.B.P. 334′; beam 35′; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, November, 1936.

DD389 Mugford and DD390 Ralph Talbot, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May, 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD
Charleston, S.C.

NEW CONSTRUCTION: **U.S.S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; launched Feb. 25, 1936; completed June 1, 1936.

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; estimated launching Aug. 1936; estimated completion, Jan. 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B. P. 600′; beam 61′8″; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, August, 1936; estimated delivery November, 1936.

CL 48, **Honolulu,** light cruiser; L.B. P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January, 1937; estimated delivery September, 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers. No date set.

PG. 50, **Erie,** gunboat; L.B.P., 308′; beam, 41″; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; launched January 29, 1936; delivered July 1, 1936.

CG 69 and CG 70, **Alexander Hamilton and John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308′; beam 41′; standard displacement 2000; geared turbine drive, express type boilers, keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia,** L.B.P. 600′0″; beam 61′,7¾″; molded depth at side to main deck amidships 42′0¾″; draft corresponding to normal displacement 21′,8½″; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

DD372, **Cassin.** L.B.P., 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships 19′,7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid, October 1, 1934; completed March 15, 1936.

DD373, **Shaw,** L.B.P. 334′,0″; beam, 35′,0-1/8″; depth molded at side to main deck amidships, 19′7-7/8″; draft corresponding to normal displacement, 10′,10″; standard displacement, 1500 tons; keel laid October 1, 1934; completed June 15, 1936.

Coast Guard Cutter No. 65, George W. Campbell; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; completed July, 1936.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61′ 9¾″, depth molded at side to main deck amidships 42′0 3/8″, draft corresponding to normal displacement 21′10″; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS 172, Porpoise; keel laid, October 27, 1933;** launched June 20, 1935; completed Jan. 15, 1936; **SS 173 Pike,** keel laid, Dec. 20, 1933; launched Sept. 12, 1935; commissioned Dec. 2, 1935; delivered May, 1936; **SS 179 Plunger,** keel laid July 17, 1935; estimated delivery Feb., 1937; **SS 180 Pollack,** estimated delivery May, 1937; L.B.P. 289′ 0″; beam 24′ 11-1/16″; loaded draft 13′9″; diesel electric engines.

Two 1400-ton submarines, SS185 Snapper and SS186 Sturgeon, order received from Navy Department; September, 1935.

A New Circular Fan

A new line of air circulating fans is announced this Spring by Propellair, Inc., of Springfield, Ohio, well known manufacturers of all types of ventilating fan equipment.

The new Propellair Circulator Fan, which can be operated at either of two speeds, is distinguished by the amount of air flow it supplies and by its thrifty use of current. Special construction has so reduced the air hum that it can be used in all rooms where a minimum of noise is desirable.

Because of its profitable use in many ship compartments of varying character, pearl grey baked enamel finish was selected as harmonizing with any interior color scheme.

As in past models, Propellair Circulators are available in four different mountings, making them adaptable to all uses.

Two new booklets, **"How To Cut Screw Threads"** and **"How To Grind Lathe Tool Cutter Bits",** have just been published by The South Bend Lathe Works, and are now available for distribution.

"How To Cut Screw Threads in the Lathe" covers the whole subject very thoroughly. Besides a detailed step by step description of cutting threads in a lathe, the booklet contains sets of tables of standard screw thread pitches and recommended tap drill sizes, definitions of various terms relating to screw threads, and several pages devoted to arrangements of gearing. Space is also given to metric screw threads, the use of taps and dies, formulas for standard screw thread forms, and several interesting shop hints and kinks.

The second booklet, "How To Grind Lathe Tool Cutter Bits," gives the methods for grinding all the popular types of lathe tool cutter bits, and illustrates the particular angles to which each cutter bit should be ground. The illustrations and the accompanying description make an excellent guide for anyone wishing to master this art quickly. The applications for which each of these tools is used is also included, and shows the manner of applying the tool to the work to obtain the maximum efficiency from the tool.

Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

● Bethlehem Starts Work on Key System Cars

According to an announcement just made by Bethlehem Steel Company, Bethlehem, Pa., work was started at its Harlan Plant, Wilmington, Del., on 60 two-car articulated units of light-weight construction that were purchased by the Railway Equipment and Realty Co., Ltd. (Key System) for operation over the San Francisco-Oakland Bay Bridge.

These light-weight units, whose bodies are to be made of Mayari R, a high - tensile, corrosion - resisting steel, will be 110 feet in length, and will seat 124 passengers. Each car will be equipped with a forced heating and ventilating system of a capacity sufficient to provide 4,000 cubic feet of air per minute.

They are designed to operate singly or up to seven units (14 cars) in a train over the bridge from San Francisco and through Oakland and its outlying districts.

● Luckenbach Launching

Mr. and Mrs. Lewis Luckenbach are celebrating the arrival of a daughter on June 10. She is their first child and, we understand, is receiving a great deal of attention from the parents, as well as from many of their friends.

● Communication Record

Advance indications are the R. M. S. Queen Mary has broken ship communication records on her maiden voyage, according to officials of the Mackay Radio and Telegraph Company, which handled the bulk of the radiotelegraph traffic from the ship.

For four days at sea, approximately 2,800 radiograms, totalling 93,000 words, and about 100 telephone calls, totalling approximately ten solid talking hours, were passed between the Queen Mary and the United States and Europe.

Some forty radio broadcasts from the ship were heard by millions on both sides of the Atlantic over the nation-wide networks in this country and the facilities of the British Broadcasting Company abroad.

The entire radio installation on the Queen Mary was supplied and installed by the International Marine Radio Company of London, an associated company of the International Telephone and Telegraph Corporation.

● A-H Personnel Changes

In view of American-Hawaiian Steamship Company's contemplated expansion of its South-Atlantic service, the following changes in personnel, as announced by Vice-President **Thomas G. Plant**, will be made, effective July 1:

D. A. McPherson, Assistant to the Operating Manager at San Francisco, will become the Company's general representative in the South-Atlantic territory, with headquarters at Charleston, S. C.

W. E. Johnson, General Claim Agent, becomes Assistant to the Operating Manager at San Francisco.

J. A. Fraser becomes General Claim Agent, with headquarters at San Francisco.

Shipboard and shore-side men of the Pacific Coast merchant fleet are watching the progress of the Marine Safety Contest sponsored by the Propeller Club of California in collaboration with the Marine Accident Prevention Bureau of coast steamship lines.
Pictured are Miss Esther Swanson, ringing up the entry of Capt. N. E. Carlson, skipper of the S.S. West Camargo.
Details of eligibility are outlined on page 11.

Propeller Club of California

President
JOSEPH J. GEARY

Secretary-Treasurer
STANLEY E. ALLEN

320 Market Street, Room 249,
San Francisco
Headquarters

Board of Governors

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CHARLES E. FINNEY
JOHN T. GREANY
C. M. Le COUNT
FLETCHER MONSON

Raymond F. Burley Addresses Propeller Club at Pre-Vacation Meeting

JUNE 2 LUNCHEON

We were addressed by **Raymond F. Burley**, freight traffic manager of McCormick Steamship, at this final meeting of the first half of the year.

Mr. Burley covered thoroughly the "Problems of Coastwise and Intercoastal Shipping" in his talk . . . a very interesting picture of present day conditions in connection with Pacific American shipping and operating. His audience agreed that this was one of the strongest, most pertinent talks ever presented at the club, and it is hoped Mr. Burley will favor us again at some future date.

George E. Swett, member of the Board of Governors, was a very efficient chairman of the day.

SAFETY CONTEST

The safety contest amongst Pacific American vessels, which is being conducted by the Accident Prevention Bureau of the Pacific American Steamship Association, and sponsored by the Propeller Club of California, is well under way.

Close to two hundred ships are entered in this contest. Details are being published on the opposite page.

Byron G. Pickard is chairman of the joint committee for the Steamship Owners Association and our own club.

SUMMER IS HERE

Although our regular meetings have been adjourned for the summer vacation period, the various committees are functioning and plans are being made for a resumption of our activities in the early Fall. All hands will be advised of resumed activities by current notice.

McCormick executive, Raymond F. Burley.

SCHOOL SHIP

The Propeller Club of California is now sponsoring the newly organized Honor Society of the California Nautical School, "California State." In the group are earnest young men studying the various phases of American shipping and merchant marine problems. Through our sponsorship, the students will have the means of visiting coastal liners and making contacts with the maritime personnel.

Captain L. E. Edelman, of the Board of Governors, is handling the arrangements at this writing, and we will bring the details to our readers as the plans are progressing.

ARTHUR TODE IS VISITOR

Honorary president of the Propeller Club of the United States **Arthur Tode** arrived in San Francisco on the S. S. Santa Paula on Tuesday, June 23. President Joseph J. Geary headed the welcome committee. Mr. Tode was guest of honor at an informal dinner on Friday evening, the 26th, which was attended by local maritime men, including members of our club. **Captain Henry Blackstone** arranged an inspection cruise around the San Francisco-Oakland and the Golden Gate bridges. Mr. Tode expressed his enthusiasm over the development of the San Francisco harbor, contrasting the big improvements with his recollections of six years ago, when he was last in our midst. He left San Francisco the last of June for Portland and Seattle.

NEW MEMBERS

Stanley E. Allen, secretary-treasurer, reports the following elected to membership:

Joseph Flaherty
Ben McFeeley, Jr.

Marine Safety Contest Going Full Speed Ahead!

American officers and seamen of the Pacific Coast merchant fleet are enthusiastic in their approval of the Marine Safety Contest sponsored by the Propeller Club of California and the Marine Accident Prevention Bureau. To date a total of 26 Pacific American owned companies have entered a total of 139 ships with a total personnel of more than 8500 officers and men.

Because a number of ships eligible to enter have not touched in a home port since the contest was launched, the committee has extended the closing date for entries to June 22. Entries are divided into three classes as follows:

Freighters—
11 companies, 91 vessels

Passenger Carriers—
6 companies, 25 vessels

Steam Schooners—
9 companies, 23 vessels

There were no entries in the tanker group as several tanker companies are participating in other safety contests. This leaves only the three classifications cited above.

An attractive bronze plaque will be awarded to the company whose fleet of vessels in each of the three following classifications has the lowest **reportable** injury frequency (based on crew man-hours exposure) during the period July 1 to December 31 inclusive. The three classifications are: (a) Steam Schooners, (b) Passenger Carriers, and (c) Freighters.

A special certificate will be awarded to the companies winning second and third places in each classification as well as to each vessel, regardless of classification, that works the minimum prescribed crew man-hours for the period July 1 to December 31 inclusive without a **disabling** occupational injury to any member of its crew.

In further recognition of any exceptional safety record made by vessels during the Contest period, the Committee has determined that any vessel attaining the certain reportable injury frequency, as stated in the printed Contest Rules and Regulations, shall be entitled to fly a special safety flag during the year 1937. The flag shall be of special design and approved by the Contest Committee.

The presentation of each plaque and certificate will be accompanied by impressive ceremonies appropriate to the event.

The Contest is limited to—

(1) American flag vessels calling at the ports of San Francisco Bay or Los Angeles Harbor.

(2) Such vessels in each classification as have worked the minimum number of man-hours prescribed in attached Rules and Regulations.

(3) Such vessels as agree to and do furnish accurate reports of injuries and man-hours worked in accordance with the Rules.

The Accident Prevention Bureau has agreed to receive, analyze, and tabulate each vessel's injury reports and man-hours, and will hold all individual and company details strictly confidential in accordance with its established custom, submitting to the Committee in charge of the Contest only such information as is required on Vessel Monthly Report Form. However, any company not desiring to furnish the Bureau with copies of its accident reports may submit each vessel's monthly experience to the Contest Committee on the form above-mentioned.

The Accident Prevention Bureau also agrees to assist each contesting vessel, master, and his Ship's Safety Committee, by furnishing Material suitable for programming and administering the intensive six months accident prevention effort.

The Contest will be in complete charge of a joint committee composed of nine members from the Propeller Club and the Pacific Coast Marine Associations' Executive Committee.

William Bennett.

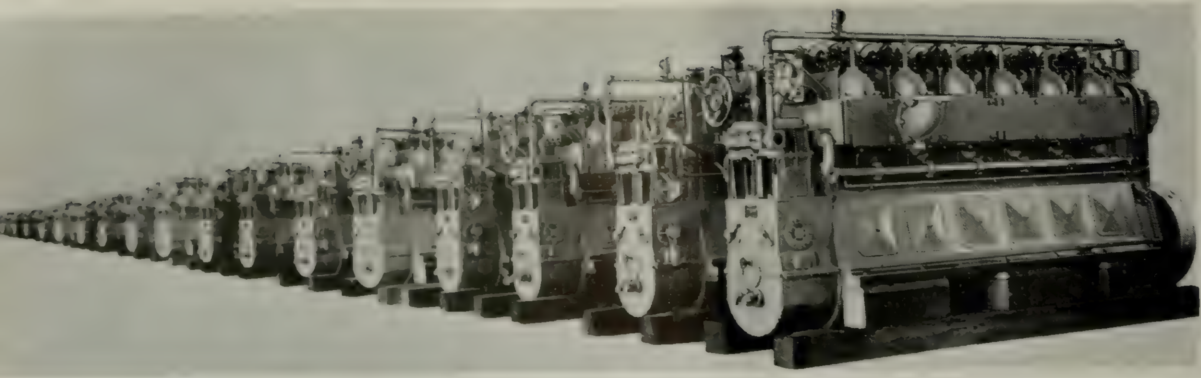
New Chief Surveyor for Lloyds Register

Mr. James French, principal surveyor for United States and Canada, Lloyds Register of Shipping, retired officially on June 1, after serving in that capacity for more than twenty years.

Appointed to succeed Mr. French is William Bennett, senior surveyor for the port of Philadelphia for the past three years, and prior to that, senior surveyor at the port of New York since July, 1925.

The committee of Lloyds is to be congratulated on a very wise choice for a successor to "Jimmie" French, whose name had become almost synonymous with that of Lloyds in the hearts and minds of American shipbuilders and shipowners, and who won for himself many personal friends in the ports of America. William Bennett, both from training and in personality, is well qualified to succeed the great "Jimmie."

He is a typical Scotch shipbuilder and naval architect; a child of the Clyde; and was born in Greenock, educated in Dumbarton and Glasgow, and apprenticed for six years as a shipbuilder to John Brown's yard, Clydebank, 1904 to 1910. While an apprentice, he won four scholarships at University of Glasgow, and graduated from that institution in 1911



U. S. C. G. patrol boats make fine record with Wintons.

with the degree of Bachelor of Science in naval architecture, with special distinction. He served for a year at the Scott's yard, Greenock, as assistant estimator, and for another year at Denny's, Dumbarton, in the research department.

In March, 1913, William Bennett was appointed ship surveyor on the chief surveyor's staff, Lloyds Register of Shipping, London. In August, 1918, he was transferred to the New York office.

William Bennett is a member of the Institute of Naval Architects (London); of the Society of Naval Architects and Marine Engineers (New York); and of the Glasgow University Engineering Society. He has contributed a number of technical papers to the meetings of the Society of Naval Architects and Marine Engineers.

Roy V. Crowder, who has been passenger traffic manager here for the Grace Line during the past five years, has been elected vice president of Kelly, Nason & Roosevelt, Inc., national advertising agency, and takes over his new duties in the San Francisco office of the concern. In addition, Mr. Crowder is vice-president of Dettner's Printing House, which connection was made immediately upon his resignation from the Grace Line. Prior to his connection with the Grace Line, he was passenger chief for the Los Angeles Steamship Company. Mr. Crowder's duties with the Grace Line have been taken over by **Clay Hutchinson,** recently appointed by **Edward T. Ford,** president of the line.

Roy V. Crowder.

Captain A. Filippo, for long one of the best known skippers in the Pacific Coast-European service of the Holland America Line, has taken over the command of the Veendam, of the same line. Captain Filippo's new ship will keep him from the Coast, where he has many friends, since the Veendam is in the transatlantic service. **Captain W. P. Webster** is the new master of the Damsterdyk, which Captain Filippo left to assume his post on the Veendam.

From Los Angeles comes word of the appointment of **Harold F. Mellander** as district manager for the Swedish American Line in that city. Confirmation has just been received from the New York office, although Mellander has been installed in this capacity since April 1. He has had wide experience in transportation work, speaks seven languages, and has traveled all over the world.

The Panama Pacific Line won the 1936 Steamship Bowling League championship held in Los Angeles, according to **William Fulton** of the Norton, Lilly team, chairman of the league who awarded the cup prizes at the close of the games.

● **18 In a Line!**

For well over two years the Winton Motors shown above have been serving the U. S. Coast Guard. Eighteen Patrol Boats, each 165 feet long, have been operating successfully during this time with enviable records of performance for low maintenance and fuel costs. Each Patrol Boat is powered with two Winton diesels of 670 horsepower each.

On a recent 5,000 mile trip, five of these Patrol Boats cruised at speeds of twelve miles per hour with a total fuel consumption for all purposes of only 32 gallons per hour. The entire cost for mechanical repairs of any nature was only $10.00 for the trip. Bantam Quill Bearings were used on all wrist pins of these motors.

The Junior Chamber of Commerce has presented **Captain Einar Hetland** with an enlargement of a photograph of the San Francisco-Oakland bay bridge, on which are the names of the officers of the organization. Captain Hetland is master of the Martin Bakke, latest of the Knutsen Line motorships operating between Europe and the Pacific Coast under the direction of the Intercoastal Steamship Corporation. The ship had an open house at the State Terminal upon her arrival, and the several hundred people who visited her declared that she was one of the finest vessels of her type ever to enter the port. The Martin Bakke has a large cargo capacity, and is equipped to carry twelve passengers, for whose accommodation she is extremely well prepared.

When the Panama Pacific's intercoastal liner California sails on her special transatlantic voyage, **Captain Theodore Van Beek** will be in command. The California will be under charter to the United States Lines, it is announced.

Control Is Vital—

★ ★ ★

Insist on G-E

AT two bells on the night watch, nine men are below. Some are having their customary coffee, one is making notes in the log, the others are watching gauges, checking oil, or making inspections. The telegraph shows full speed ahead—the turbines are whirling out 17,000 hp.

This is a typical "night lunch" on the ship whose G-E switchboard is pictured above—only nine men below, leisurely but alertly supervising the performance of this 16,700-ton liner. At their finger tips are the switches and valves that operate the entire power plant—before their eyes are the dials that check its pulse. Control is vital.

Long before this ship slid down the ways, General Electric engineers were designing control for her. They were designing equipment that would be seaworthy. Each motor, each relay, each circuit breaker, each instrument, was planned with this in mind. Every one meets the rigid requirements of those who man the ship.

Insist on General Electric control equipment—engineered for marine service. General Electric Company, Schenectady, New York.

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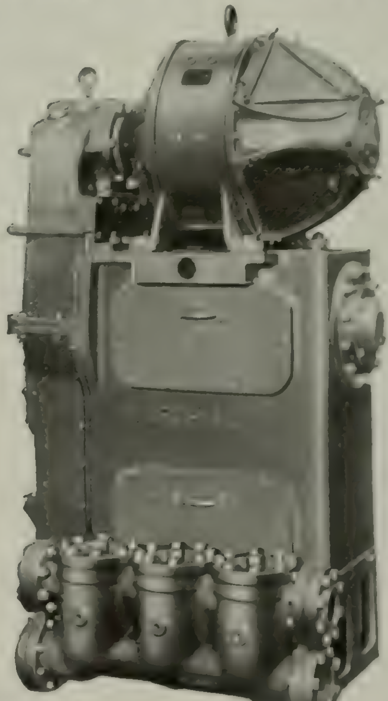

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WORTHINGTON

● Intercoastal Conference Committee

The chairman for the reorganized Intercoastal Conference will be selected by a committee of five, consisting of **John W. Chapman**, vice-president of the Grace Line; **O. P. Caldwell**, traffic manager of the Luckenbach Line; **G. A. Dundon**, Atlantic coast manager of the McCormick Line; **A. E. King**, freight trrafic manager of the Isthmian Line; and **H. W. Warley**, vice-president and general manager of the Calmar Line. A selection will be made from the applicants the committee is to meet. Several names were suggested, and a number more are to be considered.

Eric W. Hardie, general agent of the San Diego-San Francisco Steamship Company, is celebrating in Long Beach and Los Angeles shipping circles. Mr. Hardie's daughter-in-law, Mrs. Jack Hardie, has just become the mother of a boy, and we understand that the young man is already well known in the Southern cities, in no small part owing to the efforts of his grandfather.

Captain R. N. Stuart, commander of the Empress of Britain, has been appointed general superintendent of Canadian Pacific Steamships at Montreal, to succeed **Captain R. G. Latta.** The Empress of Britain will be commanded by **Captain R. G. Parry**, the first Canadian to be given command of a ship of this size on the Atlantic.

There is to be a new port warden in Seattle—**Captain Gus J. Snelling**, a veteran on the seas and long a resident of that city. He is well known in shipping circles in the northern city.

D. Stewart Iglehart, president of the Grace Line, has been presented by the Peruvian government, with the Order Del Sol, the highest honor of that country, bestowed by Foreign Minster Ullola during the former's visit to the western coast of South America.

The appointment of **Harvey M. Huff** as representative for the Standard Fruit and Steamship Company was recently announced, and Mr. Huff began his duties on June 1, after resigning his position as general freight and passenger agent for the United Fruit Company. Mr. Huff has been in business for himself since the time of his resignation.

● U. S. Lines Inaugurates Boston Service

Boston will be a regular port of call westbound for steamers in the United States Lines' New York-Liverpool-Manchester service, according to a new sailing schedule just issued by the Lines.

The new call will become effective with the sailing of the American Shipper from Manchester on July 2, and from Liverpool July 3 for New York via Belfast, thus inaugurating a direct freight and passenger service between the British Isles and Boston.

In November of the same year, in response to the demand of American importers of Irish linens and woolens and from Northern Ireland shippers, the United States Lines added Belfast as a port of call westbound. It was the first American passenger and freight service from this port, and the only regular direct service from there.

Pillsbury & Curtis, San Francisco sales agents for the Federal Composition and Paint Co. Inc., announce the appointment of T. C. Maguire to their selling staff.

Mr. Maguire is well known to the San Francisco maritime field where he has been identified as an authority on marine paints and compositions for a number of years.

The McCormick Steamship Company and the Chas. R. McCormick Lumber Company, on July 1 will establish new Los Angeles headquarters on the second floor of the Edison Building, 5th and Grand Avenues.

Present quarters in the Garland Building in Los Angeles were taken over several years ago, but continued expansion of both the Steamship and Lumber Departments has made it necessary to seek newer and larger headquarters.

The death of **Robert Norman**, who was for many years employed by the American-Hawaiian Steamship Company, has left sorrow in the hearts of a great number of friends. Mr. Norman was only thirty-six, and had been employed by the American-Hawaiian for eleven years, in which time he filled a number of positions for the company and made many friends in shipping circles. The death occurred at the Soldier's Home, Sawtelle, as the result of pneumonia. Mr. Norman was in service during the World War as a member of the A. E. F., and saw active duty in the trenches.

● George R. Murphy, Jr. Dies on Pacific Coast

George R. Murphy, Manager of the Pacific Coast District of The Electric Storage Battery Company, Philadelphia, died on May 14.

Mr. Murphy was 61 years old and had been in the employ of the Company for 36 years. He was widely known and esteemed on the Pacific coast, particularly in engineering circles and in the automotive trade.

Mr. Murphy was born in Hoboken, N.J., and was graduated from Fordham University. Later he studied electrical engineering at Columbia University, from which institution he was also graduated.

In 1900, he joined The Electric Storage Battery Company, and was employed in the Operating Department at both Philadelphia and New York. Three years later he was transferred to the San Francisco Branch, being connected first with the Operating and then with the Sales Departments. In 1916 he was placed in charge of the San Francisco Branch and shortly thereafter was made manager of the Pacific District.

Mr. Murphy was President of the San Francisco Branch of the Columbia University Alumni Association; a member of the Engineers' Club of San Francisco, the Merced Golf and Country Club, the Society of American Military Engineers, and a Fellow of the American Institute of Electrical Engineers.

He is survived by his widow, Laura Davis Murphy, a son and a daughter, his father, two sisters and a brother.

Quips That Pass in the Night!

Rastus: "Look heah, I done told you all not to shoot mah rooster, ain't I?"

Sambo: "Yas, an' I told you all to keep you' roostah outa mah garden, too, did'n' I?"

Rastus: "Dat roostah wasn't in yo garden. He jes' had his neck through dat crack in de fence."

Sambo: "Well, dat's all I shot, wuz his neck!"

First Wrestler: "How come you called off your match with me last week?"

Second Wrestler: "I had a terrible sore throat and couldn't groan above a whisper."

Minister (at baptism of baby): "His name, please."

Mother: "Randolph Morgan Montgomery Alfred Van Christopher McGoof."

Minister (to assistant): "A little more water."

A goat had eaten an express ticket, and an employee of the express company approached his superior with the query:

"Boss, what we gwine do 'bout dat billy goat? He's done et up where he's gwine."

In checking over a wealthy bachelor's income tax statement, the inspector noticed a deduction for a dependent. Triumphantly he rushed to the office of the taxpayer.

"Look here," he said, pointing to the discrepancy. "Isn't this a stenographic error?"

The old bach looked at the inspector sadly.

"You're telling me?" he said.

"You know, Mandy, a man what uses de kindo talk dat preachah of ouahs uses ain't got no right to be wearin' de cloth o' God."

"Why, what did de preachah say?" inquired the other.

"Well, when dat fire cracker went off, dat preachah runned right ovah me an' sevrul othah ladies, an' as he went thu' Ah heard him say:

" 'Dam a chu'ch wid only one do'."

"Did you ever hear anything so perfectly wonderful?" exclaimed daughter as the radio ground out the last notes of the latest thing in jazz.

"No," replied dad, "I can't say I have, although I once heard a collision between a truck-load of empty milk cans and a freight car filled with live ducks."

Mr. R., who was an habitual celebrant on all occasions, crept stealthily into his house one night, but despite his caution, fell and broke the empty bottle he was carrying in his hip pocket. He was sufficiently lucid to realize that first aid should be applied to the cuts which resulted, and accordingly backed up to the mirror and applied a generous dressing of adhesive tape. As Mrs. R. showed no signs of having been awakened, he was no little astonished when she roused him next morning with, "So you came home drunk again last night!"

"Why, my dear, what in the world gave you that idea?"

"Well, if you were sober," she countered, "will you please explain how the adhesive tape got all over the mirror?"

In the spring a young man's fancy lightly turns to what the girls have been thinking of all winter.

A young man who was slightly under the influence of strong drink was remounting the curb that had just tripped him, when a policeman popped up.

Young man: "Did you see me fall?"

Policeman: "Yes, I saw you fall."

Young Man: "Did you see me get up?"

Policeman: "Yes, I saw you get up."

Young Man: "Then what's my name?"

Policeman: "How should I know your name. I've never seen you before."

Young Man: "Then how do you know it was me that fell?"

Gushing Lady: "Oh, Mr. Jones, we are collecting funds to help the starving Chinese. May I put your name on the succor list?"

"Moe: I'm going to take up a profession.

"Joe: What are you going to be?

"Moe: A street sweeper.

"Joe: That's not a profession, that's a pursuit."

ESSAY ON PANTS

Pants are made for men and not for women. Women are made for men and not for pants. When a man pants for a woman and a woman pants for a man, that makes a pair of pants. Pants are like molasses—they are thinner in hot weather and thicker in cold weather. There has been much discussion as to whether pants is singular or plural. Seems to us that when men wear pants it is plural, and when they don't wear pants, it is singular. If you want to make pants last, make the coat first.

Senior: I sure had a swell time at Donovan's last night. They had a beer-drinking contest.

Junior: You don't say. Who won second prize?

She "How was your party last night?"

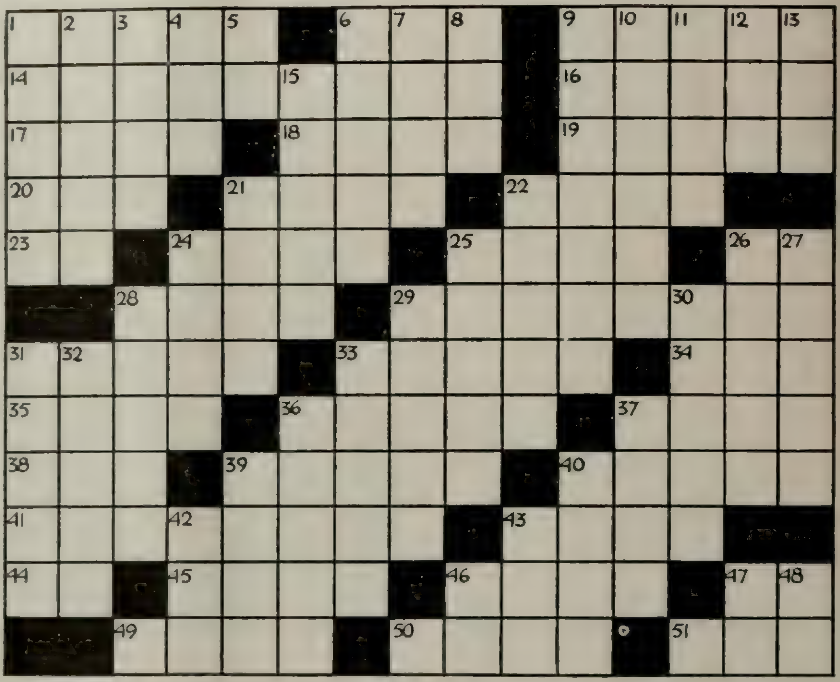
Voice on wire: "Oh, we're having a swell time."

"Tell me papa," asked Johnnie, "What is a consulting physician?"

"He is a doctor who is called in at the last minute to share the blame."

. . . . *An Original*

Pacific Marine Review Cross-Word Puzzle



We didn't make up one of these puzzles last month. "Maybe no one works 'em anyway!", says we to ourselves. But we were wrong! So—bowing to good old Vox Pop and with an obeisance to "Constant Readers" from Killisnoo to Mazatlan, we crash through with another sea-going cross-word. And good going to you!

HORIZONTAL

1. Morse, International—and the rest.
6. Where pa meets the school-marm.
9. When things get out of control—this is on.
14. A web-footer.
16. The gangsters took the victim for this (double word).
17. What the trade-wind did.
18. What the sick Limey did in the pub.
19. A woman is only a woman—but this is a smoke.
20. Royal Order of Roughnecks.
21. An old-time hoose-gow.
22. What the passengers feed.
23. A famous news service.
24. You'll find three of this in every yard.
25. A passenger vessel in embryo.
26. Motor ship.
28. Boiler innard.
29. Big league stuff.
31. To a farmer these mean land; to a dentist, teeth.
33. Highway hotel in the Tehachapi.
34. What the bride said (double word).
35. Grade E lubricant. (Not so hot, eh?)
36. The little guy with the bos'n arrows.
37. A sort of a mixture.
38. A little devil.
39. Biblical Herod.
40. Shut-eye.
41. Fogs the issue.
43. A darn good car.
44. You and I and the United States.
45. A low down digit in the plural.
46. Meadows.
47. A Seattle newspaper (abb).
49. Fellows who work for a principle (abb.).
50. This queen just came across.
51. An association (see front cover).

VERTICAL

1. They charm him with music.
2. A deck.
3. What the lucky hunter brought home.
4. Edward George Windsor's initials.
5. Ed Wynn's favorite word.
6. Better pick up one of these at the bar.
7. Chinese weight.
8. A conjunction.
9. One of the seven.
10. Union Oil product.
11. Near.
12. "Sweet as apple cider!"
13. Only half a dancer.
15. North American Amalgamated Order of Eephases. (Terrible — but we got stuck!)
21. Guests of the Navy.
22. They put "ill" with this word when the ship is lost.
24. A square-meal for the engine.
25. Just plain nuts.
26. A Gilbert and Sullivan maid with one eye out.
27. Sailing vessel.
28. Voyages to a ship.
29. A Latin nephew. (Believe it or not!)
30. Here's that California town again.
31. We would have added w and y, had we room.
32. What the beach-comber does.
33. What travel advertising does.
36. Goddess of the Harvest or something.
37. We repeat. (See 43 horizontal.)
39. What you have to do to get 3 vertical.
40. Ditto.
42. Just an essential in a machine.
43. Poetic over.
46. Musical note, 'specially with two together.
47. The guy mentioned in 6 horizontal.
48. This is is.

PACIFIC MARINE REVIEW

AUGUST • 1936

1836

One hundred years of
Steam Navigation on the Pacific

1936

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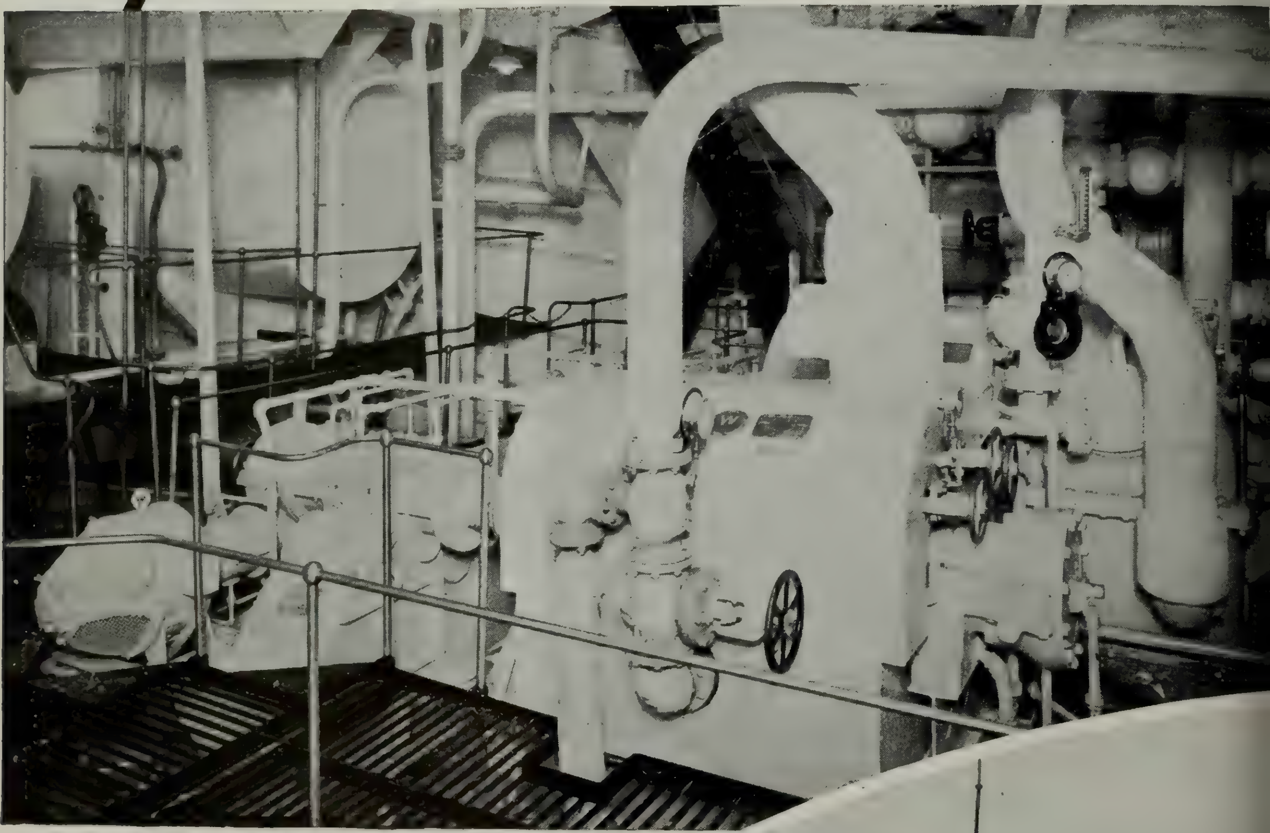
Steamship Association

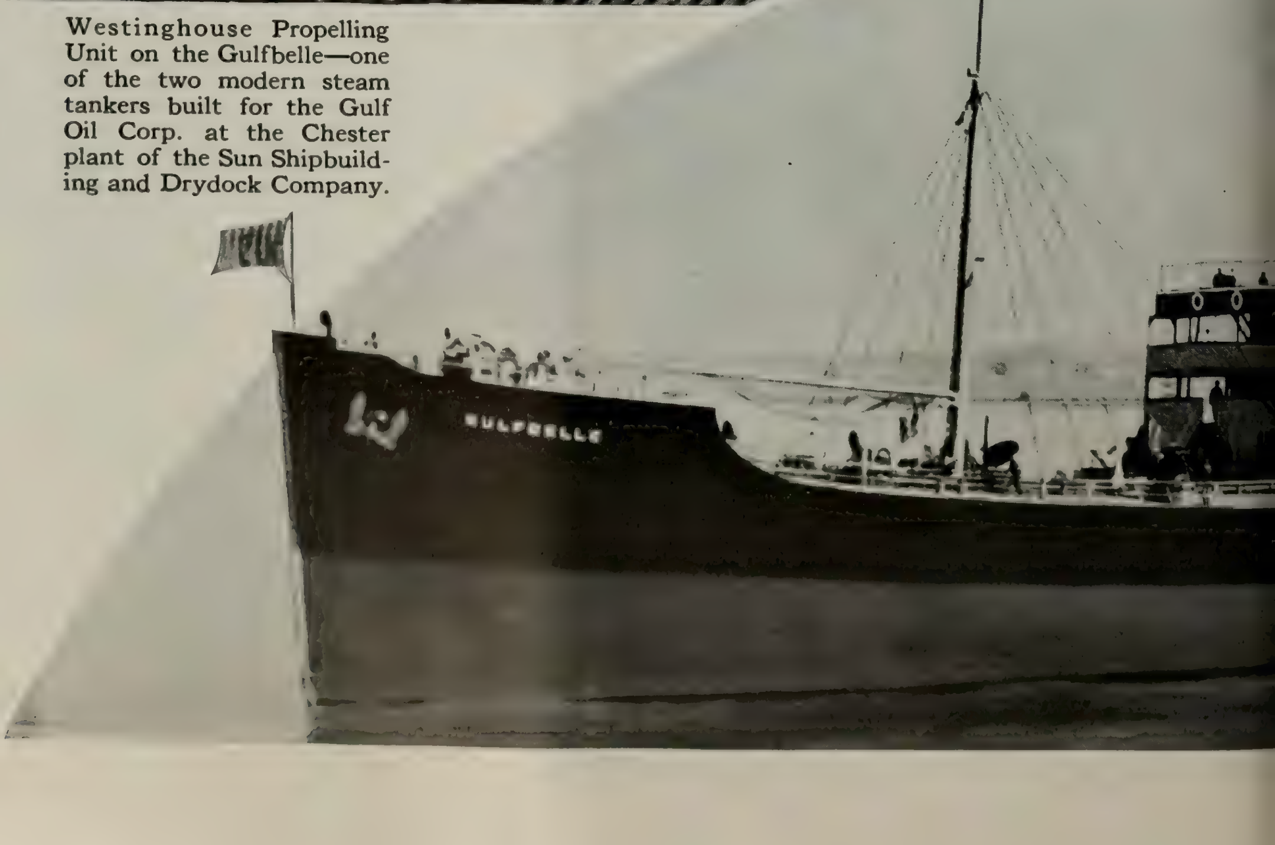
Shipowners Association
of the Pacific Coast

WESTINGHOUS

Geared Turbine



Westinghouse Propelling Unit on the Gulfbelle—one of the two modern steam tankers built for the Gulf Oil Corp. at the Chester plant of the Sun Shipbuilding and Drydock Company.



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PACIFIC MARINE REVIEW

AUGUST, 1936
VOL. XXXIII NO. 8

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American-Hawaiian's original S.S. Californian, built by Union Iron Works, San Francisco, and delivered to the company on June 28, 1900.

—Photo from the private collection of Roger D. Lapham.

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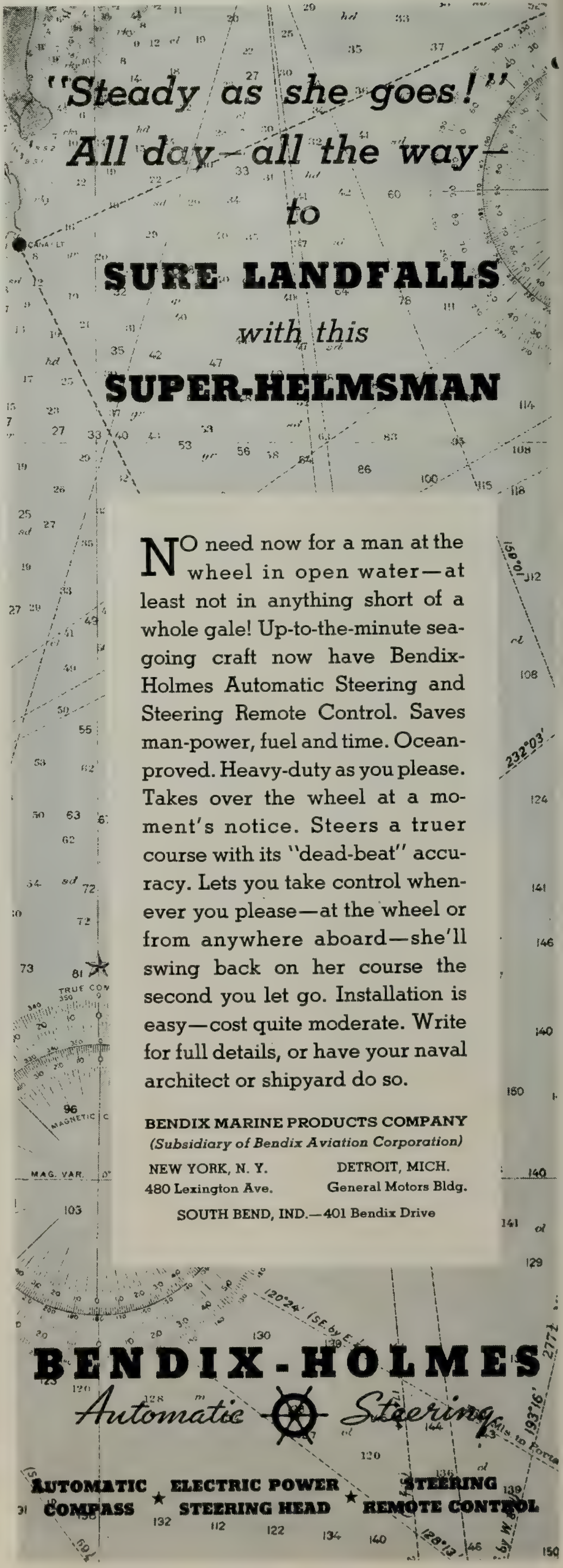

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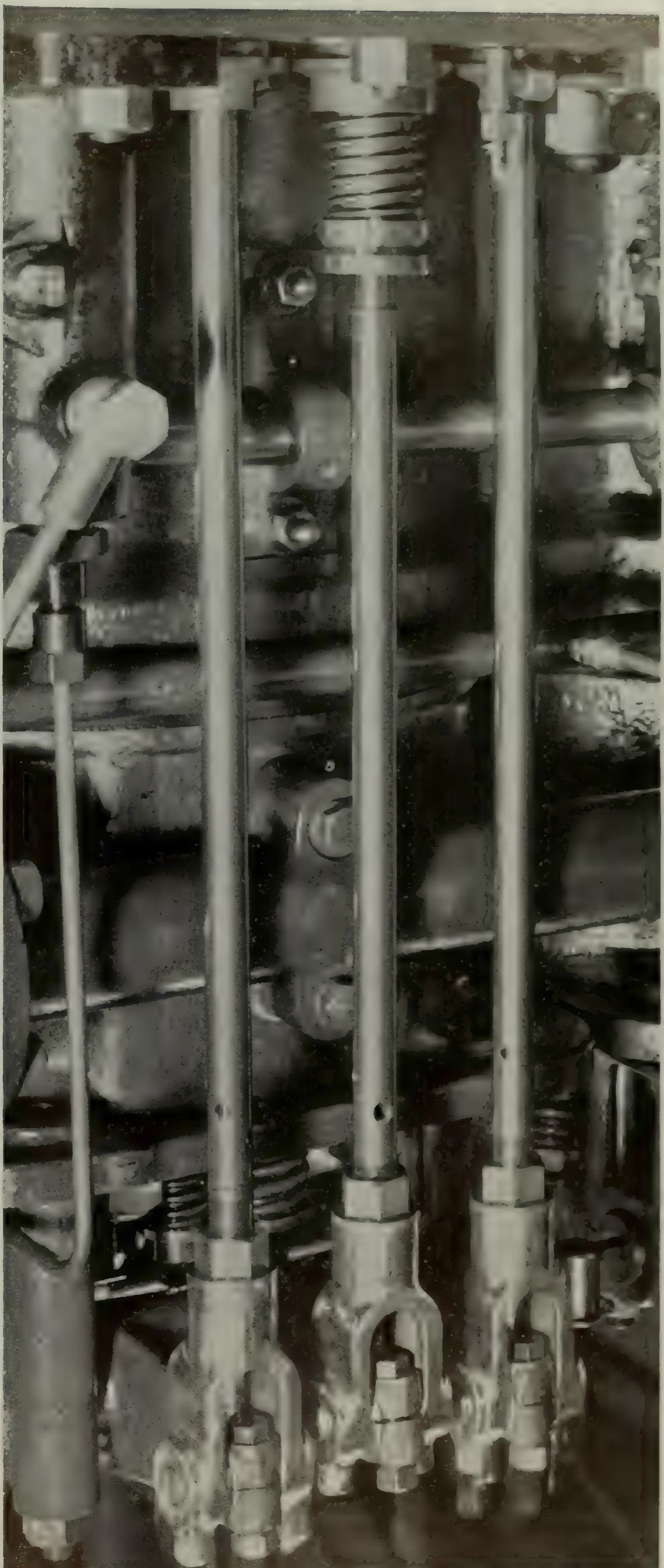
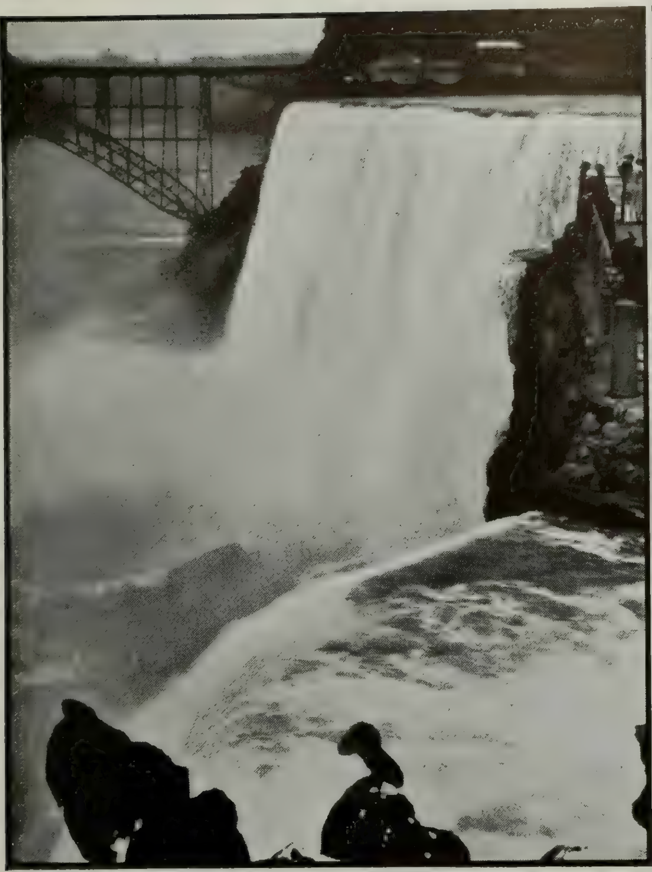
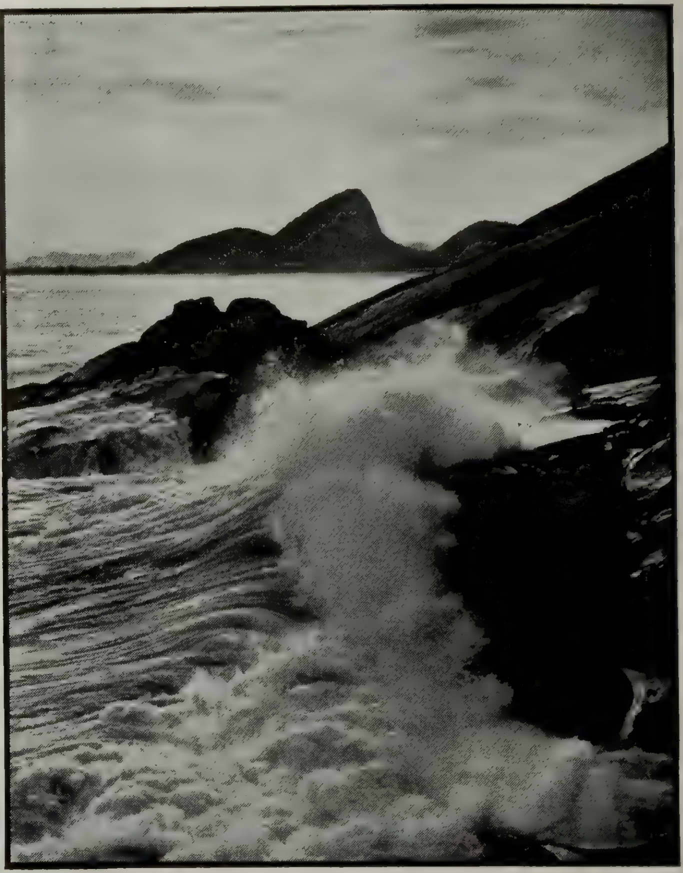


Caught in action by the candid lens of staff photographer William Schoeb at the plant of Enterprise Engine Corp., in San Francisco.





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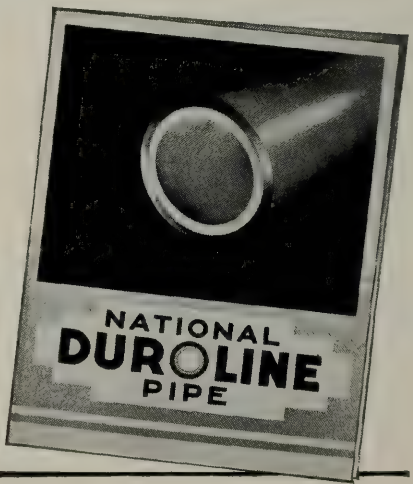

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PACIFIC MARINE REVIEW

VOLUME XXXIII AUGUST 1936 NUMBER 8

Editorial Comment »« »«

Choosing a Maritime Authority

Presumably President Roosevelt has been busily sifting the more than 150 names presented to him from various sources, as likely material from which to select five commissioners who will steer the American merchant fleet to success under the Merchant Marine Act of 1936. It may indeed be quite possible that he shall have announced his choice of commissioners before this copy of Pacific Marine Review has reached its readers.

Be that as it may, the fact remains that the language of the Act puts a very unwise limitation on the choice of commissioners. No one is eligible who in the past three years has had any pecuniary connection with a shipowner or a shipbuilder or with any relative of a shipowner or a shipbuilder.

This would technically bar out not only all shipowners and all shipbuilders who are actively engaged in those industries, but all marine insurance, marine law, stevedoring, terminal, cargo forwarding, ship chartering and ship supply experts, as well as all the thousand and one types of manufacturers and suppliers that deal with shipbuilders. Practically any business man in America might be ineligible under this clause. Certainly every man who has during the past three years worked on a ship, in a shipyard, on a dock, in a steamship office, or in any plant or firm manufacturing articles for use in or selling articles to a ship or shipyard, would technically be estoped from exercising the powers of a commissioner on this Authority.

Who, then, will be the eligibles possessed of "eminent fitness" for this very important work? Evidently they will be the present executives of Shipping Board and other Federal Maritime Bureaus, and the executives of the shipping and shipbuilding industries who since the beginning of the depression have been out of work.

Fortunately, these eligibility clauses are usually regarded by the executive not as a limit on choice but as a face saver in refusing awkward appointments. If a good man, highly qualified and acceptable to the administration, can be obtained, these clauses are forgotten. If the name of a good man, highly qualified but not desirable to the administration, is presented with too much pressure, these clauses are invoked to save executive face.

Considerable pressure is being exerted to have a representative of maritime labor on this Authority, but there would seem to be no real reason for such representation unless the other maritime interests are also represented. Employers and customers in any industry are at least equally entitled with labor to representation on any regulatory body governing that industry.

Would it not be much better to adopt the sensible method in forming such commissions? The Martime Authority is for the purpose of regulating the maritime industry; therefore the maritime industry should have a hand in the appointment of the commissioners in some such manner as follows:

One to be chosen by the American Steamship Owners Association, representing ship operators;

One to be chosen by the American Shipbuilders Association, representing shipbuilders;

One to be chosen by the American Federation of Labor, representing maritime labor;

One to be chosen by the Chamber of Commerce of the United States, representing shippers;

A chairman to be chosen by the President of the

United States, to represent the interests of the United States.

This chairman should be of the best type of judicial intelligence, so as to be able to compose the differences and adequately appraise the constructive suggestions of the various elements making up the Maritime Authority.

A commission so composed would represent the best minds and keenest thought of all phases of the maritime industry, and would soon solve many of the problems and minimize the remaining difficulties of our overseas shipping.

Our Present Shipbuilding Boom

The news flashed over the wires two weeks back that a total of eight tankers—$13,000,000 worth of ships—had been ordered by one oil company from three American shipyards without the formality of bids, was like a strong tonic to the long-suffering American shipbuilder. If our memory serves, this is the largest single order of that type without Federal assistance in the history of American shipbuilding.

Pacific Marine Review for some time has been predicting a boom in shipbuilding, and it is now definitely here. The marine department that ordered these tankers is the best informed in the business, and it is evident that it was securing options on shipbuilding ways by this order. There will be more such orders before the year is out.

Between the demands of the naval program, the tanker program, and the merchant shipbuilding program visualized by the Merchant Marine Act of 1936, the shipyards of America will be more than full. Already the experts of the Shipping Board Bureau Research Department are issuing press releases declaring that in building up of an adequate replacement program for our merchant fleet the chief handicap is lack of shipbuilding ways.

The American shipbuilder is certainly facing a series of "fat years."

Standardizing American Ship Types

America is preeminently a land of standardization. We fairly worship the word. In our last great shipbuilding effort, we standardized ships. Unfortunately, we standardized in types that were practically obsolete before they were launched. Let us be careful that we do not repeat that mistake.

Certain committees in connection with the Shipping Board Bureau are working now on standardized types—tankers, cargo ships, combination ships, liners. These committees, if we are correctly informed, are very conservative in adopting advanced ideas in either hull forms or power plants.

One of the most dangerous enemies to real progress is the standardization of conservatism. Because of this type of standardization, we built hundreds of standardized vessels fifteen years back that cost us $300 or more per deadweight ton capacity, which had to be sold in a year or two for $25 or less per deadweight ton. If we standardize on any types for our presently contemplated program of shipbuilding, so far as is humanly possible they should be types projected ten years into the future in hull design, propulsive efficiency and fuel economy.

There are very few overseas vessels in the American Merchant Marine today that can compare in these factors with the most advanced products of the world's shipyards. Our advanced steamers have 450 pounds of steam; those of Europe have over 1,000 pounds. We have very few overseas motorships; Europe and Japan have large fleets of the most modern motorships.

The most advanced ships today will in all probability be the standard ships of five years hence for the merchant fleets of the world. Any replacement program for our American foreign trading merchant fleet should be composed of ships amply able to compete with the best afloat under any flag on any route, so far as propulsive efficiency is concerned. If we can achieve a standardization today on such a plane, tomorrow and the day after will have no regrets.

Pacific Marine Review Twenty-Five Years Ago

The Pacific Marine Review issued its No. 8, Volume 8 about August 15, 1911, under the editorship of H. B. Jayne, assisted by associate editor Captain Emil Francke, and printed by R. L. Davis Printing Company, the publishing office being at 379-380 Arcade Annex, Seattle. Copies of this issue were proclaimed possible of obtainment at the news-stand at the entrance to the "Merchants Exchange Hall," San Francisco, at twenty cents each. (Editor's note: It is still possible to purchase copies at the same place for twenty-five cents.)

British Columbia Salvage Company had quite recently done a very creditable bit of work in salvaging the Pacific Coast Steamship Company steamer Spokane, stranded at Plumpers Bay after striking a rock in Seymour Narrows. Particular mention was made of the perfect condition in which everything on the steamer was kept by the salvagers. "No looting, no pilfering of any kind took place!" Passengers' jewelry, trinkets, and other belongings were still in the respective staterooms. Not even the purser's room was tampered with, and the contents of the safe, which held the necessary amount in cash for operating on the southeastern Alaska cruise, as well as deposits made by passengers, were intact. The manager of a marine insurance firm declared that he never before in all his long experience saw passenger baggage landed from any wreck in better condition.

W. R. Grace and Company had just ordered from William Hamilton and Company, Glasgow, an oil burning 12-knot cargo vessel to be named Colusa. She was 410 feet long, 55 feet beam, and 23 feet, 6 inches load draft, and had a deadweight capacity of 8,000 tons. She was built on the Isherwood longitudinal framing system and was especially designed for the lumber trade between Puget Sound and west coast of South America.

The Fore River Shipbuilding Company reported shipping three Curtis marine turbines of 8,000 shaft horsepower each from their Quincy, Mass., plant to Naples, Italy, for the Italian scout cruiser Nino Bixio. Three more for the cruiser Marsala were nearing completion in the shop. These turbines ran at 450 revolutions per minute. Their overall dimensions were 9 feet, 4 inches width and 21 feet, 6 inches length.

Editorial comment on United States federal politics averred: "We shall not be surprised if the Democratic Party is a very serious factor at next presidential election, provided it exercises moderately and usefully the control which it now holds in the House of Representatives and practically the balance of power in the Senate, and does not attempt any extreme or sensational legislation."*

A bill had been introduced in the House by Representative W. D. Stephens of California, providing for the purchase, charter, or construction of not less than six steamships to be run by the Panama Railroad Company in the Pacific Coast trade between Seattle and Panama, this service to be extended upon the opening of the canal to include ports between Seattle and Boston. (This was the beginning of what proved to be a very irritating and painful thorn in the side of the American Merchant Marine.)

*(Apparently the Democratic Party leaders took this advice, for in 1912 they put Woodrow Wilson in the White House. Like most political leaders, they have never acknowledged the good advice.)

World's Greatest Shipping Nation

In point of gross tonnage of shipping per citizen, Norway stands out in a class by herself as the greatest shipping nation in the modern world. In fact, to find her equal one would probably have to go back to the days when Noah landed from his great ship and found himself the sole shipowner in an exceedingly wet world.

For every one thousand inhabitants in Norway today, there are 1388 gross tons of ships in the Norwegian merchant marine. Next in line comes Danzig, with 649 gross tons per thousand population, followed by Great Britain, with 439 gross tons.

In round numbers, Norway has three million inhabitants and four million gross tons shipping, of which 16 per cent is less than five years old.

Maritime Labor Problems

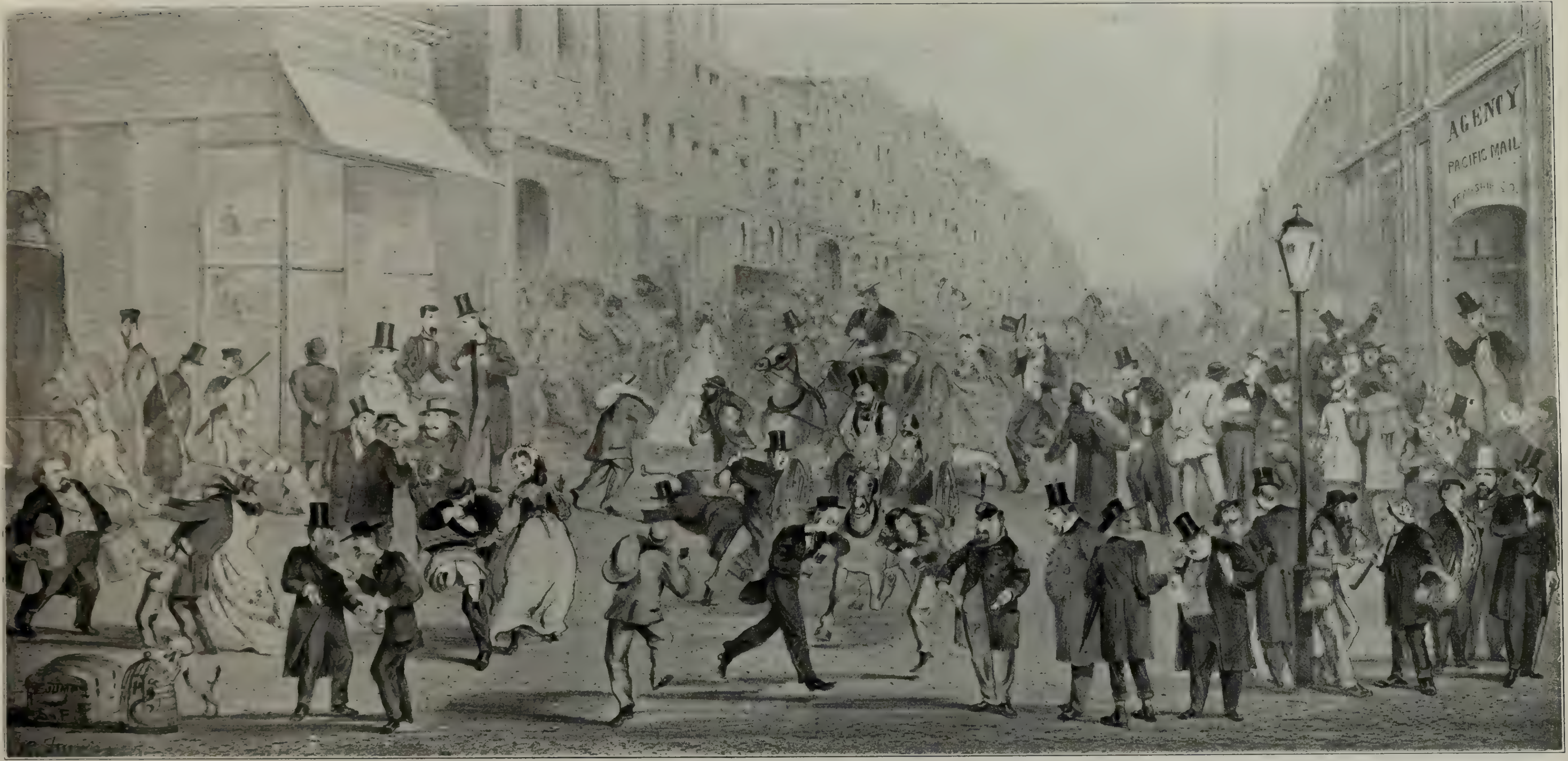
The Merchant Marine Act of 1936 specifies clearly: that all licensed officers of vessels documented under the laws of the United States shall be citizens of the United States, native-born or completely naturalized; that upon each departure from the United States of a cargo vessel to which a construction or an operating subsidy has been granted, all of the crew of said vessel shall be citizens of the United States, native-born or completely naturalized; and that "for a period of one year after the effective date of this Act, upon each departure from the United States of a passenger vessel in respect of which a construction or an operating subsidy has been granted, all licensed officers shall be citizens of the United States as defined above, and no less than 80 per centum of the crew (crew including all employees of the ship other than officers) shall be citizens of the United States, native-born or completely naturalized, and thereafter the percentage of citizens as above defined shall be increased 5 per centum per annum until 90 per centum of the entire crew, including all licensed officers of any such vessel, shall be citizens of the United States, native-born or completely naturalized."

No American can take exception to such a provision, except to remark that it is going to be difficult to find enough qualified men to fill these requirements. An American Merchant Marine should be manned by American citizens who are inspired by American ideals, and filled with a determination to represent fitly American trade and American foreign policy in the overseas world.

However, before this beautiful ideal can be accomplished even by Congressional fiat, there are several adjustments to be made. If every master and every deck hand, every chief and every wiper, on American ships is to be 100 per centum American, it would seem to us only reasonable that in every maritime labor union in the United States, the officers and the membership would have to be 100 per centum United States citizens, native-born or fully naturalized.

The labor agreements under which Pacific American ships are now operating provide hiring halls practically operated by the labor unions. Employers must take the help sent them. Under the Merchant Marine Act of 1936, if employees so sent are not United States citizens as defined above, then the shipowner is subject to a fine of $50 for each man so employed.

Today the entire maritime labor situation of the Pacific Coast of the United States is dominated by one individual, who is neither native-born nor fully naturalized. If the Congress of the United States desires to see the American Merchant Marine 100 per centum United States citizens, it had better instruct the U. S. Department of Labor to purge alien influences from American organized maritime labor.



Steamer Day in San Francisco. The other day, calling at the office of a prominent San Francisco marine insurance broker, we were met by our friend with the exclamation, "Sorry; can't talk to you today. Great rush. Mail for Honolulu leaves on the Malolo in two hours." It was steamer day in San Francisco. In fact, every day is now steamer day in the city by the Golden Gate, and there are daily clearances of fine, fast steamers for all the ports of the Seven Seas. Back in the fifties, however, it was another story, and steamer day came once a month when the mails left via Panama for the Atlantic seaboard cities. We have no photographic record of those exciting days, but the photographic eye of the great pioneer cartoonist, E. Jump, has set down in the above illustration his impressions of steamer day in San Francisco in 1866.

. . . . *Pacific* Steam Centennial

Some Notes on 100 Years of Steam Navigation on the Pacific Coast

By R. J. Alexander

Lest steamship operators become unduly proud, we place here a view of the deck of the good ship Three Brothers of San Francisco, converted to sail from the steamship Vanderbilt in 1873. Photograph made in 1885 and used through the courtesy of Tubbs Cordage Co.

On May 7, 1835, a great throng of people assembled at or near the shipbuilding yard of Green, Wagram and Green, Blackwell on the Thames, to witness the launching of a small brig which was christened Beaver. The records claim that there were over 150,000 people in the crowd, including King William IV and all his court. The good ship Beaver was being built and outfitted for the Pacific Ocean Service of the Honorable Hudson Bay Company, and when launched she had in place in her hull a steam engine and boiler built by Boulton and Watt. This engine was arranged to drive side paddles, the paddle wheels and their shaft being stowed in the hold along with sponsons and the paddle wheel boxes, since it was intended that the ship should be sailed out round the Horn and finished as a steamer after her arrival at Fort Vancouver on the Columbia River.

She sailed from Gravesend on August 27, 1835, her crew including: D. Home, captain; W. C. Hamilton, first mate; Charles Dodd, second mate; Peter Arthur, chief engineer; John Donald, second engineer; Henry Barrett, carpenter; and William Wilson, George Gordon, William Phillips, James Dick, George Holland, James McIntyre, and William Burns, able bodied seamen. She arrived at Vancouver April 10, 1836.

S. S. Beaver was a well built vessel constructed of English oak, and was of the following dimensions:

Length overall	101.4 feet
Beam	20 feet
Depth	11 feet
Net measurement	109.12 tons
Draft ready for sea,	
Forward	9.6 feet
Aft	10.6 feet

Her boiler was equipped for wood burning, and on her river and coastwise trips she carried four stokers and thirteen wood cutters, in addition to her regular crew of six A. B.s and a boatswain. Her officers were the same as above, with the exception that Charles Dodd was promoted first mate and A. Lattie appointed second mate.

So equipped and thus manned, the Beaver, on June 26, at 2 P. M., crossed the Columbia River Bar and became the first steamer to breast the long Pacific swells and the brave summer trade winds of the northern Pacific Coast.

For many years thereafter she was in service on the north coast, running in and out of every bay, river or inlet, between Columbia River and Alaska. In 1860, after extensive overhaul, she was put in passenger service between Victoria and New Westminster. Later the Imperial Hydrographic Service chartered her for survey work. Returned to the Hudson Bay service in 1870, she was again overhauled, and in 1874 was fitted as a towboat and sold to British Columbia towboat operators. She served as a tug until July, 1888, when she was wrecked near the entrance to the harbor of Vancouver, B. C.

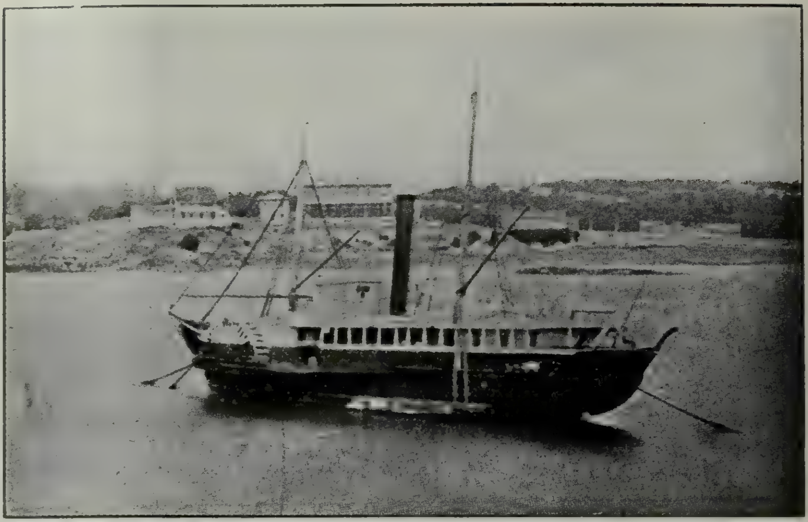
Thus we see that the first steamer to navigate Pacific Coast trade routes had an unusually long and useful career. Her history is replete with interesting incidents relating to life in the raw in those great solitudes, and to human ingenuity in meeting and overcoming unexpected difficulties both on deck and in the engine room. However, the purposes of this article are served by setting her up as a starting point—the first steamer on the Pacific Coast.

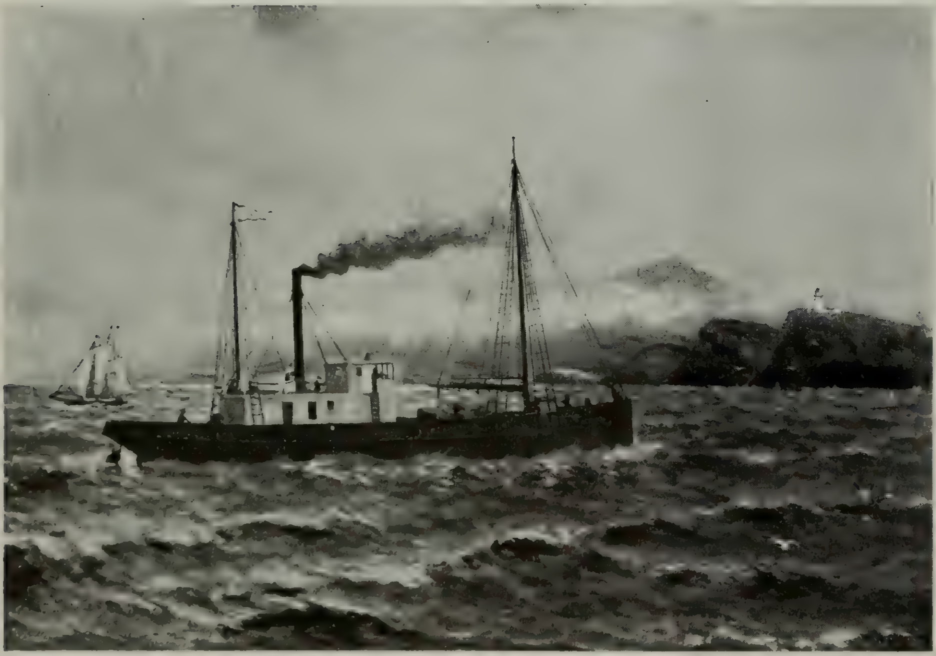
### ● Early Steamers in China

In making these claims for the Beaver, we are not unaware of the very early introduction of small steamers for river and harbor work in the south of China. The present position of China at the world's council table makes the story of these steamers very interesting.

In the diary of E. C. Bridgeman, a pioneer American missionary in

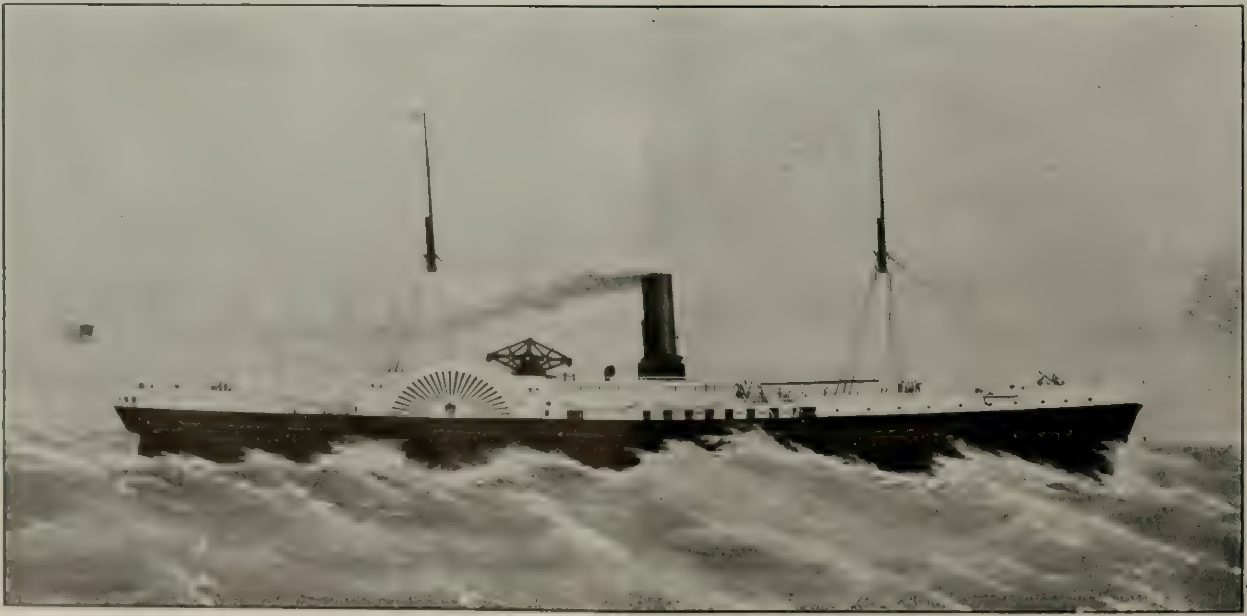
Three Pioneer Pacific Coast Steamships





The Hudson Bay steamer Beaver, original pioneer in steam navigation on the Pacific, is shown above in Victoria Harbor. At left is a reproduction of a painting by W. A. Coulter, through the courtesy of A. B. Cahill, showing the steamship Salinas, first coastwise vessel of Goodall and Nelson.

Below: The famous Pacific Mail steamer Golden Gate.



China, we read, "Arrived at Macao on April 19, 1830, in the steamer Forbes, the first ship of the kind that has ever visited these shores. She's a wonder to the Chinese; they call her Fo Shune (The Fire Ship)." In 1832, a Canton paper contained an advertisement of the steamer King-fa, which read, "she carries a cow, a surgeon, and a band of music, and has rooms elegantly fitted up for cards and opium smoking."

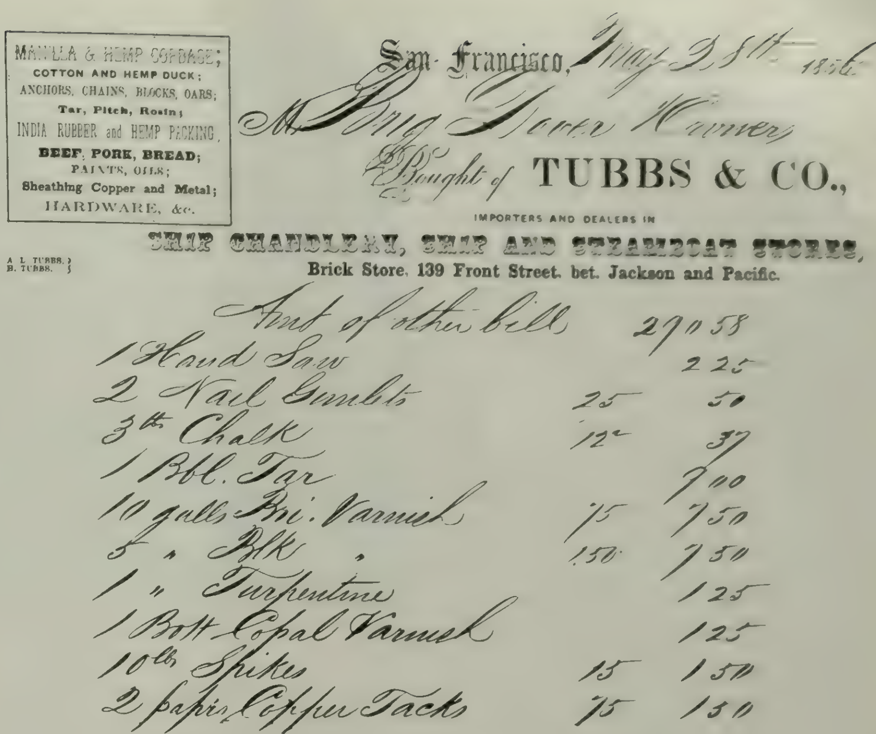
In 1835, the foreign merchants in and around Canton, tired of the "inconvenience, tardiness, and uncertainty" of having to communicate with their shipping and their residences by ships' boats, tried to place a small steamboat in that service. The reply to their petition for this privilege was substantially that, as far as the Chinese officials were concerned, regulations were regulations, and a steamship was no different from any other ship.

The steamship would therefore sit in the offing unless she had cargo to discharge, and communicate by ship's boats the same as the other ships. If she attempted to pass the forts, a "thunderous fire and attack" would be directed against her. "On the whole," concludes this Chinese official document, "since he (the master of the steamer) has arrived within the boundaries of the Celestial Empire, it is right that he should obey the laws of the Celestial Dynasty. I order the said foreigner to ponder this well and act in trembling obedience thereto."

The steamer in question was the Jardine, eighty-five feet long, seventeen feet beam, and six feet draft. She had been sailed out from Aberdeen as a schooner and her machinery installed after arrival at Lintin.

● The Russians in Sitka

In the latter part of the 18th century, Gregor Ivan Shelikof, the head of a large Siberian fur-trading company, began planning to establish permanent Russian colonies on the larger islands of the Aleut chain and on the mainland of Alaska. In 1790, he appointed Alexandre Baranof as his manager and agent in those regions, and Baranof, after establishing posts at Kadiak Island and Prince William Sound, came to Norfolk Sound in 1800 and established a colony which, after some set backs, finally, in 1804, became firmly established as New Archangel (later Sitka).



MANILLA & HEMP CORDAGE;
COTTON AND HEMP DUCK;
ANCHORS, CHAINS, BLOCKS, OARS;
Tar, Pitch, Rosin;
INDIA RUBBER and HEMP PACKING,
BEEF, PORK, BREAD;
PAINTS, OILS;
Sheathing Copper and Metal;
HARDWARE, &c.

San Francisco, May 28th 1856

M Brig Dover & Owners

Bought of TUBBS & CO.,

IMPORTERS AND DEALERS IN

SHIP CHANDLERY, SHIP AND STEAMBOAT STORES,

Brick Store, 139 Front Street, bet. Jackson and Pacific.

A. L. TUBBS.
B. TUBBS.

Amt of other bill		270 58
1 Hand Saw		2 25
2 Nail Gimblets	25	50
3 lbs Chalk	12½	37
1 Bbl. Tar		7 00
10 galls Bri. Varnish	75	7 50
5 " Blk "	1 50	7 50
1 " Turpentine		1 25
1 Bott Copal Varnish		1 25
10 lbs Spikes	15	1 50
2 papers Copper Tacks	75	1 50

Reproduction of part of an invoice on an order of goods supplied to the brig Dover at San Francisco, 1856.

Courtesy of Tubbs Cordage Company

Baranof had built several vessels at Kadiak and at Resurrection Bay, and by 1806 had a set of shipbuilding ways and some shops built. He secured the services of an American shipyard superintendent by the name of Lincoln, who was to receive a bonus of 1000 roubles for each ship launched. From these ways were launched the brig Sitka, in 1807, the ship Okrietie, in 1808, and the schooner Chirikof, in 1809.

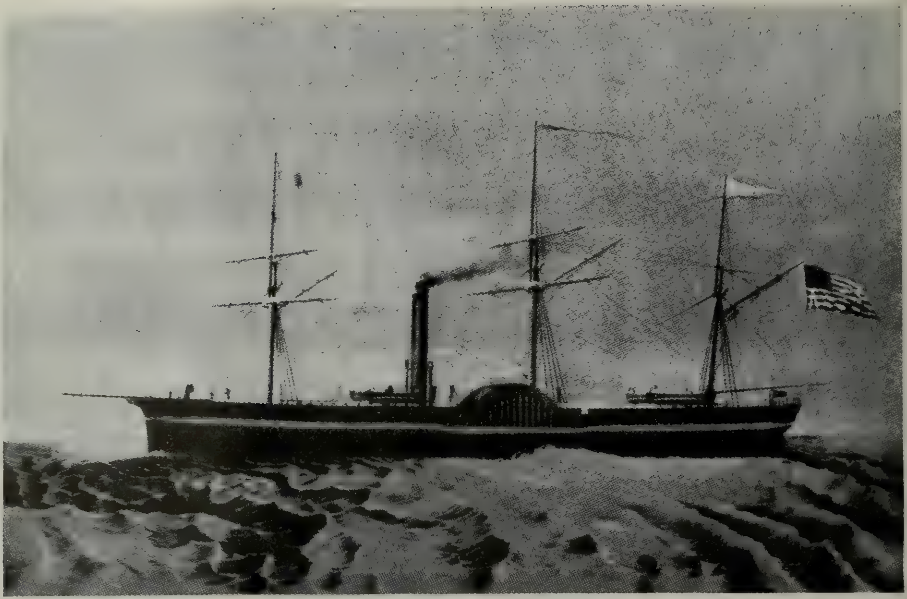
About 1839, the Russians turned their attention to steam. It is characteristic of Baranof's policy that the Sitka yard was now in charge of a half-breed native of Kadiak Island, named Netyvetoff, who, having proved teachable, had been sent to St. Petersburg to learn the shipbuilding trade. This man was responsible for the hulls. To take care of machinery, Baranof imported a Scotch machinist named Muir.

During the period from 1839 to 1860, quite a number of side wheel steamers and tugs were built in this yard, and the yard itself was built up into quite an establishment, so that, in 1845, it was probably the best equipped steam shipbuilding plant on the shores of the Pacific Ocean.

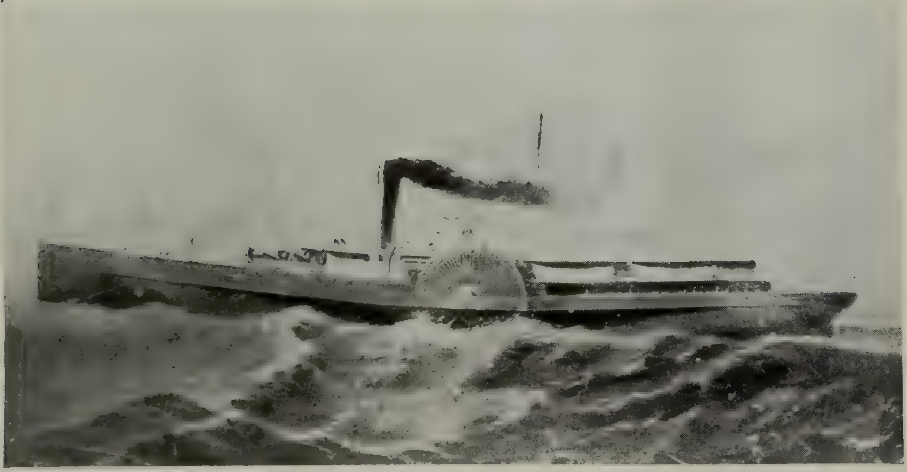
A Mr. A. J. Findlay, writing about a visit to Sitka in 1847, says, "The arsenal is the next object which attracts the attention of a stranger, from the number of men employed either building new or repairing old vessels. At this moment they are building a new steamer, destined, I think, for Mr. Liedesdorf, of California. The workmanship appears good and solid; everything for her is made on the spot, for which purpose they have casting-houses, boiler-makers, coopers, turners and all the other 'ers requisite for such an undertaking. The boiler is almost completed, and is made of copper. They have also their tool makers, workers in tin and brass, chart engravers, sawyers and sawmills, for all of which occupations suitable establishments have been made."

The most notable product of this yard, and the last vessel of any consequence built there, was the famous Politkolsky, finished in 1863. In 1867, the Russian government wound up the affairs of the Russian American Trading Company, in the process of turning Alaska over to Uncle Sam. This steamer was sold to a Sitka firm for $4000, who in turn sold her to a San Francisco firm for $6000. She was run down to San Francisco, where her copper boiler was sold for

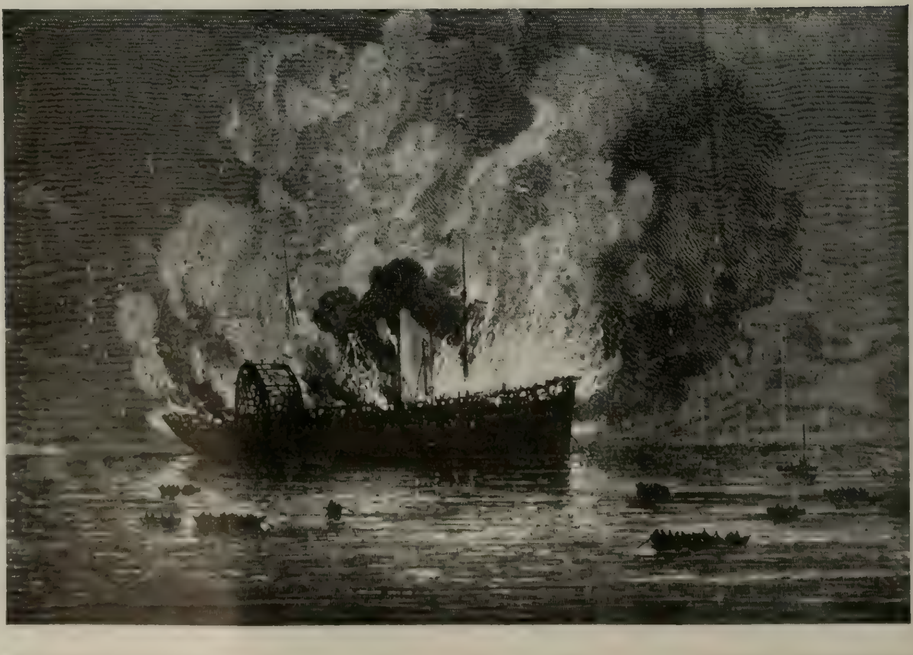
Pacific Side Wheel Steamers



The pioneer United States flag steamer on the Pacific, S.S. California.
(Courtesy of Wm. Muir)



The old side wheeler S.S. Orizaba, a favorite coastwise steamer for many years.
(Courtesy of W. E. Symons)



The burning of the Pacific Mail Steamship Company side wheeler America, largest of the wooden side wheel steamers built for that company. Fire took place in Yokohama harbor August 24, 1872.

(From an old woodcut in the Behrman collection) more than the total price paid for the vessel. An iron boiler was installed and, after a thorough overhaul, she was taken up to Puget Sound and shortly afterwards sold to the Port Blakely mills, who used her as a towboat for log rafts up to 1897. She was then sent to St. Michael and used there as a lighter until 1902, when she was driven ashore and abandoned.

The "Polly," as she was known all over the coast, had a steeple compound engine that had been taken out of a Russian fur-trading steamer apparently built in Baltimore. She was 130 feet in length, measured 175 net tons, and had 352 horsepower. She was so solidly built of heavy cedar timbers that her hulk resisted the elements on the St. Michael's beach for more than ten years after her stranding.

The reference here to a compound steam engine is interesting. Much of the discussion in the early meetings of the Institute of Naval Architects, London, was concentrated on the relative merits and demerits of single cylinder versus multiple cylinder expansion of steam. As late as 1865, even the great Scott Russell puts the weight of his opinion against the division of steam expansion into more than one cylinder; and yet here is a steamer built in the wilderness of Alaska in 1863 and being equipped with a compound engine built some years previously in Baltimore, Maryland. The pressure employed was probably around 25 pounds gauge, and represented an increase of 150 per cent over the 10 pounds that was probably tops for the Beaver.

● Early American Efforts

In October, 1847, the Russian bark Naslednik sailed in through the Golden Gate with the Sitka, a 38-foot side wheel steamboat, on her deck, consigned to Mr. Leidesdorf, of San Francisco. As has been already mentioned, this vessel was built at the Sitka yard of the Russian-American Trading Company. During November of that year, her owner and a party of friends steamed up the river in the Sitka, taking six days for the trip from San Francisco to Sacramento. Probably they steamed at five knots for two or three hours, and then tied up at the bank and sweated ashore for eight or nine hours cutting wood to burn for another two or three hours steaming on the river.

In the following February, the Sitka was foundered by a "norther." Her hull was hauled ashore, her machinery removed and, after being rigged as a yawl, she was rechristened Rainbow, under which name she saw long and useful service on the bay, making far better progress in the summer trade winds than she had ever made as a steamer.

In the late forties, several side wheel steamers for river and harbor service were built on the Columbia and at San Francisco.

Then came '49 and the great Gold Rush. San Francisco almost overnight became a metropolitan seaport, and the Golden Gate a Mecca for the ships of the world.

● The Steamers of the Argonauts

Since every man starting on a search for gold is in a hurry, it was quite natural that many minds in 1849 considered the problem of applying steam to the transportation of that great frantic mob of gold-seekers. The problem was formidable. Three sea routes were available:

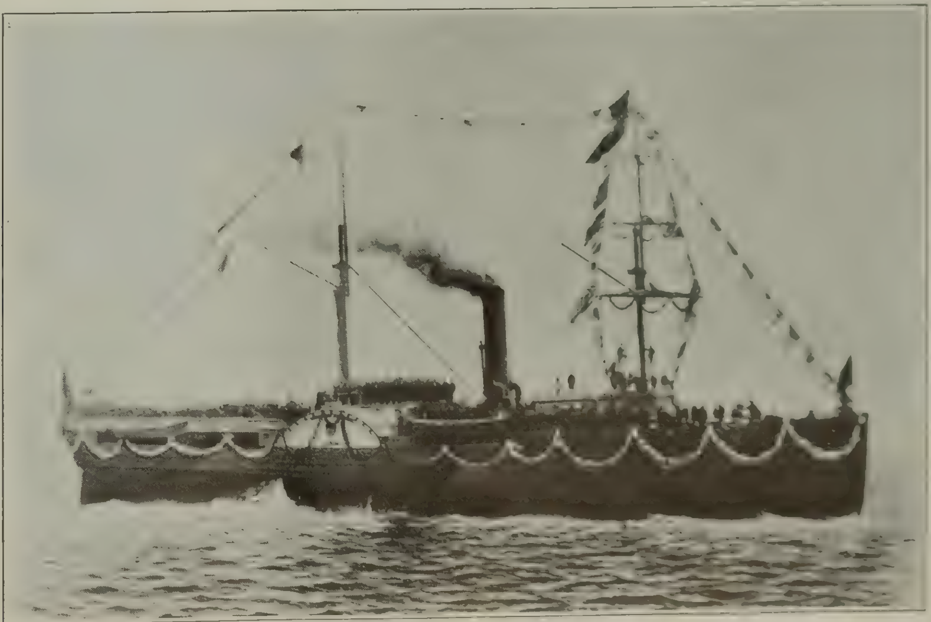
(1) The all-sea route around the Horn or via the Straits of Magellan.

(2) The sea route by the Isthmus of Panama—Atlantic ports to Chagres—across the isthmus by foot or horseback—Panama to San Francisco.

(3) By sea to Vera Cruz—across Mexico to a Pacific port—and thence by sea to San Francisco.

There were no vessels available at that time that could carry enough coal to steam the entire distance by Route (1). Coaling ports were few and far between, and there were no coaling ports at all on the Pacific Coast. Panama seemed the most possible route, and the Federal government at Washington elected to assist private enterprise thereon with mail contracts. This promised assistance persuaded private capital to come forward, and lines were promptly established.

The Law Line operated from New York to Chagres, and the Aspinwall



The pioneer Pacific Mail steamship California, celebrating her twenty-fifth anniversary on Feb. 28, 1874, when she took a party of San Francisco celebrities on an extended cruise around San Francisco Bay.

DIMENSIONS	COLUMBIA	TENNESSEE	PANAMA	CALIFORNIA	OREGON	GOLDEN GATE	J. L. STEVENS
Length on deck	220 feet	212 feet	200 feet	200 feet	200 feet	265 feet	280 feet
Length on keel	219 "	....	....	....	....	....	270 "
Breadth of beam	29 "	35 "	32 "	33 "	34 "	40 feet	40 "
Depth of hold	13 "	22 "	21 "	20 "	20 "	22 "	26 "
Tonnage	....	....	1087 tons	1050 tons	1100 tons	2030 tons	2450 tons
Engines	side lever	side lever	side lever	side lever	side lever	oscillating	oscillating
Diameter of cylinders	57 inches	75 inches	70 inches	70 inches	70 inches	85 inches	85 inches
Stroke of piston	5 feet	8 feet	8 feet	8 feet	8 feet	9 feet	9 feet
Diameter of paddle-wheels	22 "	32 "	26 "	26 "	26 "	31 feet	32 feet

Table showing the principal characteristics of seven of the early Pacific Mail side wheelers, reproduced from the History of Steam Navigation by Rear Admiral George Henry Preble, U. S. N.

Line, afterwards the Pacific Mail Line, operated from Panama to San Francisco and Oregon. These were true pioneer efforts. The ships had to be designed and built, and on the Pacific Coast every shore facility necessary for the servicing of such ships and for their docking, documenting, loading and unloading, had to be created and located.

The first steamer of the Aspinwall Line, the California, left New York on October 6, 1848. No experienced steamship captain or chief engineer was available. A river steamboat experience had to suffice—and she was away on a little jaunt of about 12,000 miles. After some troubles, she made her way through Magellan Straits and on December 12, 1848, rounded Cape Pillar and became the first steamer to fly the Stars and Stripes on the Pacific Ocean.

The California was soon followed by the Panama and the Oregon. By 1853, this line had seven steamers in regular service from Panama to San Francisco. These were substantially-built ocean-going steamers, and were equipped elaborately with every then known device for passenger comfort and safety. Their names, together with their principal dimensions, are listed in the table herewith.

Many accounts of the building and operating of these ships are available, and the best of the material from all of the accounts is to be found in the booklet, "Genesis of the Pacific Mail Steamship Company," by John Haskell Kemble. Gleaning from this book, we get the following rough sketch:

Of the first three steamers, the California and the Panama were built by that most famous of American shipbuilders, William H. Webb, while the Oregon was built at the yard of Smith and Dimon. They were practically identical.

The engine and boilers of the California were made by the famous Novelty Iron Works of Stillman, Allen and Company. Her two boilers, as was then the usual practice, were rectangular in shape and of the return flue type, using salt water, and having a total heating surface of 3636 square feet. The pressure was probably about 12 pounds; the vacuum induced by the jet condenser about 24 inches. Her engines were of the side lever type, with one cylinder 70 inches diameter of bore and 8 feet stroke, driving side paddles 26 feet in diameter fitted with 24 buckets 8 feet 9 inches long across the face of the wheel.

This power plant generated 208 nominal horsepower and could be pushed up to 300 horsepower with safety. California and her sisters were originally rigged as three-masted brigantines, and carried a good area of sail. This was later cut down to two masts.

On the voyage out from New York, the principal concern in loading was to stow enough coal. Five hundred tons were got aboard. Characteristic of the lack of seagoing steam experience prevailing at the time was the realization, when the cross head of the engine cracked two days out from New York, that the spare was stowed under the coal. So they limped most of the way to Rio with the cracked cross head at work. Another item proving the same point was the lack of ballast tanks to compensate for displacement lost as coal was consumed. Thus the engine room logs show such items as, "Vessel very light and rolling much. Wheels out of water half the time," or "Burning wood and small coal mixed. Ship rolling paddles 6 feet out of water." The lines of the hulls were very fine, being practically the same as those of the great clippers. In fact, these vessels were practically sailing ships equipped with boilers, engines and paddle wheels.

The speed at sea depended largely on wind conditions. Running down New York Bay on October 6, 1848, as

U. S. Coast and Geodetic Survey steamer McArthur was a pioneer in charting much of the Pacific Coast north of San Francisco.

Enterprising photographers, and particularly the great Taber, sold many photographs in the old days by this pleasant custom of grouping ship and officers. Through these old solio prints, we are able to see the type of men who pioneered in steam navigation and engineering in the sixties of last century.

she started her maiden voyage, California made 12 miles an hour. Her best 24 hour run, between New York and Callao, Peru, averaged 11.87 miles an hour. For 42 steaming days on this run, her average was 8.68 miles an hour.

A comprehensive account of this first voyage, and of her subsequent career, will be found in the February issue of Pacific Marine Review.

The success of the Pacific Coast side of this venture, notwithstanding difficulties that were almost universally thought insurmountable, gave a great impetus to steam navigation and almost instantly started steamer lines in the most remote quarters of the Pacific Ocean. Great, too, was the enthusiasm engendered in the minds and hearts of the marine engineers, naval architects, and inventors, and it is from this period that we must date the real beginning of ocean navigation.

We note also, in examining the progress made during the twenty years from 1850 to 1870, that all of the new developments in steam navigation were influenced by the competition of wind power and stimulated by the tremendous improvements in sailing ships. The fifties were the American clipper ship era at its best, and the sixties were the greatest British clipper era.

In 1853, the American side wheeler Golden Age arrived at Liverpool, where she attracted a great deal of attention. She was said to be the first ocean-going vessel without a bowsprit ever seen in a British port. From Liverpool she ran out to Sydney and made the record passage to that date. On May 11, 1854, she cleared from Sydney for Panama via Tahiti. Sydney to Tahiti took 13 days. At Tahiti she lay six days taking on 1,200 tons of coal. On May 31, she cleared for Panama, where she arrived on the 19th of June, just in time to transfer her 200 passengers, mails, and a million sterling in gold, to the West Indies steamer Magdalena at Chagres. Consequently, letters mailed in Sydney on May 11 reached the addressee in London on July 18, sixty-seven days from Sydney. And that certainly made the British press sit up and take notice. Witness this enthusiastic outburst from the ultra-conservative Edinburgh Journal:

"Thus to American skill and enterprise credit is due for first opening direct steam communication across the vast Pacific, in that manner connecting Australia and Europe by the medium of Panama. We cannot read without regret that the spirited proprietors of the Golden Age have incurred a dead loss of several thousand pounds by the experiment, solely owing to the cost of coal at Tahiti. But they have shown what can be done, and nothing can be more certain than that ere long arrangements will be made sufficiently economical to enable a regular line of noble steamships to traverse this novel route, and so bring us within two months' distance of Australia. Ever since Columbus set out across the Atlantic in search of India it has been the dream of commerce to reach the East by the West, and from the time that Balboa caught a glimpse of the great trans-American ocean from the heights of Darien, the world has looked forward to the junction of the two oceans at one point or another as the commencement of a new era in the history of commerce. Nevertheless, the Pacific has hitherto been a field of adventure rather than of regular commerce. Till recently it has been cut off from all direct communication with the trade and civilization of Europe and America. No maritime nations of importance have occupied any part of the extensive line of coast by which it is circumscribed, and within which it has lain in silent repose rather like a secluded lake than a mighty ocean. But a new destiny is beginning to dawn upon it. The 'Golden Age' breaks in upon its isolation, and arouses it from its slumbers. She inaugurates an era in which its commerce will probably as far transcend that of the Atlantic as the latter eclipsed that of the Mediterranean."

In 1855, the United States steam side wheel frigate Mississippi, under command of Commodore M. O. Perry, became the first U. S. naval steamer to circumnavigate the globe, incidently opening up Japan on the way, and so adding a new and very energetic competitor in the great struggle for control in the trade lanes of the Pacific Ocean.

Meanwhile, the British had not been idle. Before 1840, the Peninsula and Oriental Steam Navigation Company were approaching steam navigation on the Pacific, and had established mail steamer service between Bombay and Suez. In 1842, this service was expanded with a line from Calcutta to Suez, and before 1850, was out in the Pacific with lines from Hongkong to Shanghai and from

Hongkong to Suez. Shortly thereafter, the P. and O. extended its service to Australia. This firm was the first to adopt the then new experiment of propellers at the stern instead of wheels at the side. In 1852, they decided to use this revolutionary improvement on the steamers Chusan and Formosa, built for the Hongkong-Shanghai run, and on two larger steamers, the Bengal and the Candia, for the Honkkong-Suez run.

Another early British enterprise, the Pacific Steam Navigation Company, was established on the West Coast of South America in 1841. There is a curious story cited by Rear Admiral George Henry Preble in his "History of Steam Navigation." It seems that, "The first steamer on the Pacific Coast was a small craft named the Telica, commanded and owned by a Spaniard named Mitrovitch, but his career, as well as that of his vessel, was a short and melancholy one. In a fit of despair at his want of success, he fired his pistol into a barrel of gunpowder, blowing up his vessel in the harbor of Guayaquil, and destroying himself and all on board, except one man." This event is said to have taken place in 1834, which would place the Telica ahead of the Beaver.

Mr. William Wheelright, of Massachusetts, then American consul at Guayaquil, was so impressed with the opportunities for steam navigation on the West Coast of South America that, failing to get encouragement from his own government, he went to England and on February 17, 1840, secured a charter for the formation of the Pacific Steam Navigation Company, with the assurance of a small subsidy for carrying British mails. Two side wheel wooden steamers, the Chile and the Peru, were put on the run between Valparaiso, Chile, and Guayaquil, Ecuador, early in 1841. These were sister ships 198 feet overall length and 50 feet beam over paddles, with engines of 150 horsepower.

To trace out all the changes and developments in steam and steamships that took place on the Pacific during that extremely active thirty years between 1850 and 1880, would be far beyond the scope of this article. At the beginning of this period, American ocean-going steamers were all of wooden construction, operated by side wheel paddles with side lever or oscillating engines and rectangular return flue boilers generating steam at 10 to 15 pounds pressure. Very promptly, the American practice on side wheel drive standardized on the overhead beam engine substantially as it is used on many ferries and river boats to this day.

During the second decade of this period, the screw propeller came into fairly general use on ocean-going craft, and was actuated by horizontal, inclined, or inverted vertical engines of one or more cylinders, and generally with gearing to raise the speed of revolution. Gradually compounding gained in favor, and by 1880 the triple expansion engine, much as we have it today, had been worked out on paper and installed on a few ships. Iron had superseded wood as a shipbuilding material, and mild steel was being considered to replace iron. During all of this period, and even into the "gay nineties," sail formed an important item in the deck equipment of steamers. This latter item was particularly important on the Pacific, because many of the steamer routes on this ocean allowed advantageous use of sail, and because the great distances between Pacific coaling ports made it difficult to carry sufficient coal for full-power steaming for the entire distance.

The marine steam engine took many weird forms during this transition period, but the marine engineers managed to make notable progress. The surface condenser and use of fresh water in boilers, with evaporation for makeup feed water, and separate feed pumps and heaters, were introduced just after the beginning of this period. With fresh water in the boilers, it was practicable to go

The British lines of packet ships running out to Australia in the late sixties introduced what was known as the auxiliary steam clipper type. We picture here the Great Victoria, of the Liverpool and Australia Steam Navigation Company. These vessels were fitted so that the propeller could easily be hoisted up on deck when driving before a fair wind.

to higher pressures, and the marine engineer was not slow to grasp the economies made possible by that move. In 1850, the general run of marine engines operated at 15 pounds or less; by 1880, the pressures were generally 90 to 100 pounds. This meant that a horsepower that required 25 pounds of the 1850 steam could be obtained from 14 pounds of the 1880 steam, and that the 1880 engine would occupy less than half the space and would weigh less than half as much as an engine of the same power installed in 1850.

United States Coast and Geodetic Survey steamer Hassler, an excellent type of coastwise steamer in the late seventies.

● Some Pioneer Firms

A few American firms begun prior to or during the early stages of this period are still supplying the maritime trade of the Pacific Coast. And since San Francisco was then and is today the most important maritime center on the Pacific Coast, it is not surprising that we should find these firms either having strong agencies, branch houses, or headquarters in that fair port for ships inside the Golden Gate.

Through the courtesy of the Tubbs Cordage Company, we recently were privileged to look over an old ledger wherein were set down in clerkly penmanship the accounts of Tubbs and Company, with various sailings and steamships from January 1, 1854, to December 31, 1857. From this ledger, we glanced a list of steamships that had purchased ships' supplies from this firm. Some of the names are those of noted and historical bay, river, and ocean craft. Others may bring up fond recollections to old-timers. That there should be such a list doing business with one ship chandlery firm, proves the importance of the steamer at this early date. We quote the list in the order in which the names appeared in the ledger, with the year on which the account opened:

S.S. E. Corning	1854
S.S. Peralta	1857
S.S. Senator	1854
S.S. Urilda and reference to old register	1854
S.S. Queen City	1854
S.S. Cornelia	1854
S.S. Clinton	1854 and prior
S.S. Major Tompkins	1854 and prior
S.S. Comanche	1854 and prior
S.S. New World	1854 and prior
Union Line Steamers	1854 and prior
S.S. Guadalupe	1854
S.S. Crescent City	1854
S.S. California	1854
S.S. H. T. Clay	1854
S.S. General Kearney	1857
S.S. Confidence	1854 and prior
S.S. Marion	1854
S.S. Eudora	1854
Steam Tug Rescue	1854
S.S. America	1854
Steam Tug Carolina	1854
San Francisco St. Tug Co.	1854
S.S. J. Bragdon	1854
S.S. Secretary	1854
S.S. Antelope	1854
S.S. Helen Hensley	1854
S.S. Wilson G. Hunt	1854
S.S. Peytonia	1854
S.S. Constitution	1857
S.S. Republic	1857
S.S. Brother Jonathan	1854
S.S. Enterprise	1854
U.S. Survey Steamer Active	1855
S.S. Eclipse	1855
S.S. Reindeer	1855
S.S. Panama	1855
S.S. Ellen Craig	1855
S.S. Seabird	1856
S.S. Surprise	1857
Steam Tug Resolute	1857
The Steam Dredger	1856
S.S. Goliah	1857

In 1857, this ledger opens an account with the Pacific Mail Steamship Company for large bills of supplies delivered at the "Benecia Depot" for the steamships Columbia, Golden Gate, Sonora, Republic, and Golden Age.

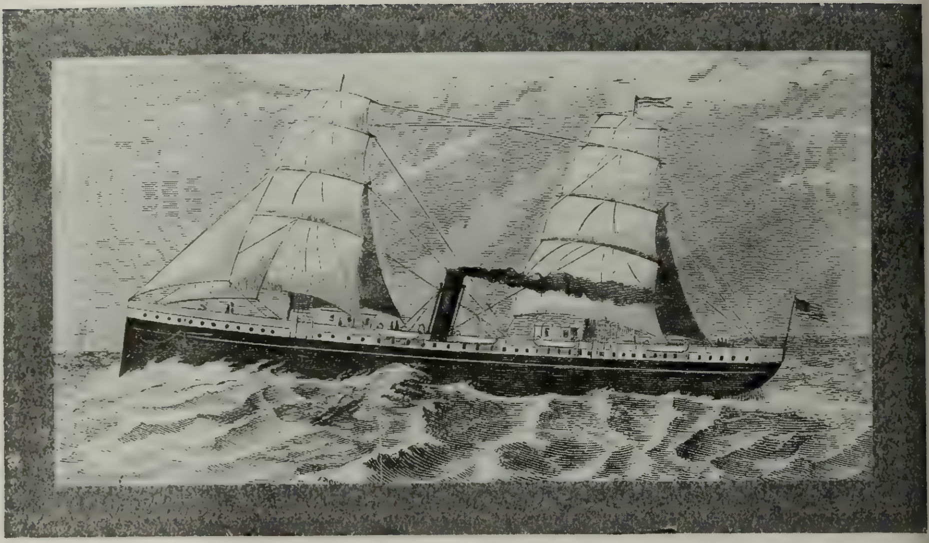
Another well-known name that was prominent in the engine rooms of steamers built in the fifties of the last century, is that of Worthington. In 1840, Henry R. Worthington, then a young draftsman of 23, was working on the design of a steam-driven canal boat. One of his chief difficulties was to find a satisfactory feed pump that would work while the boat was passing through the canal locks and the engines were not working. Up to that time, the universal practice for the feed pump had been direct connection to the main engine — usually the so-called "Doctor" worked by a rod from the side lever or the beam. Worthington designed the simple direct-acting steam pump, an absolutely new design in hydraulic and steam machinery.

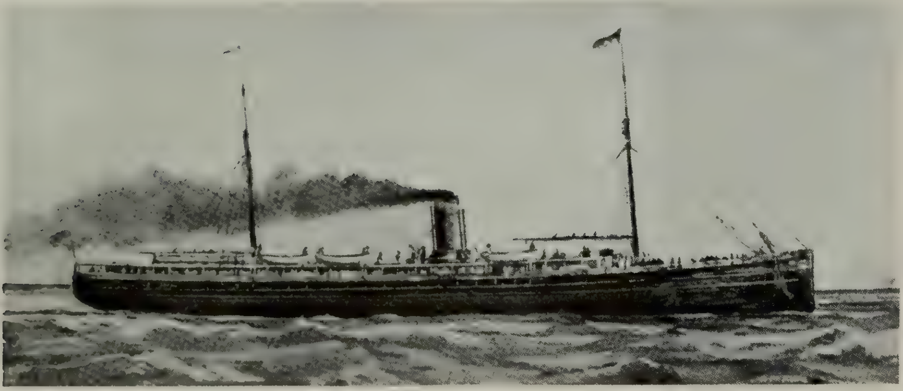
Encouraged by the success of this pump, Worthington turned seriously to hydraulic engineering and, in 1845, formed a partnership under the company style of Worthington & Baker and began building pumps in a small shop in Brooklyn. This firm placed many pumps on early American steamers, some of which were prominent in Pacific Coast steam navigation.

The early records of the firm show installations on steamer Bay State, 1849, and in the fifties and sixties on steamships Washington, Pacific, Atlantic, Atlas, Great Republic, America, Roanoak, Colorado and others.

Screw Steamers of the 70's

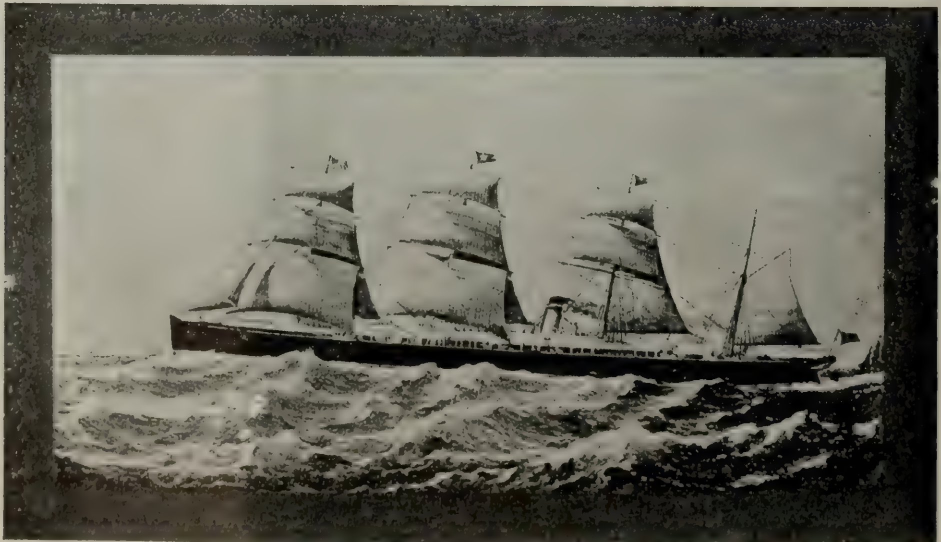
They Still Carry Plenty of Canvas





The Pacific Mail steamer Colima, delivered in 1874, was in her day a crack liner on the Australia run, and later ran for many years between San Francisco and Panama. The famous Pacific Coast steamship Queen, at left, was built by Cramp and delivered in 1880. She could run 16 knots at sea and was for many years a favorite in coastwise service.

At right: The White Star liner Oceanic, built by Harland and Wolff in 1871 and chartered for transpacific service by the Occidental and Oriental Steamship Company in 1874. First steamer with bathtubs, and first with first-class passenger accommodations amidships. In a good northwest trade wind, she could sail faster than she could steam.



The installation on the Washington, 1850, is of particular interest because the water cylinder of this pump was the first ever built with multiple small poppet valves in place of one large hinged flap valve, which was then standard for all pumps. In 1857, Worthington brought out the duplex direct-acting steam pump, which in principle and essential details furnished the model for every duplex pump now on the market.

Metallurgy was one of the hard problems with the early designer of engines and boilers, but much valuable experimental knowledge on this subject had been acquired in the first half of the 19th century. Way back in 1810, one Cyrus Alger established a foundry in Boston, Massachusetts, and began experiments trying to produce a better grade of cast iron. He invented a process of purifying iron by the use of an "air furnace," and produced a metal that found great favor at once as material for the armaments of that day, and soon began to make its way into the construction of machinery and engines. This product became known as gun iron.

In trade journals as early as 1857, we find this foundry firm describing themselves as "manufacturers of steamboat engine work such as crossheads, pistons, etc." This Boston foundry was the beginning of the present great Hunt-Spiller Manufacturing Corporation.

Perhaps the best way to show the progress made in design and construction of steamers between 1850 and 1880 is by a comparison of typical ships. The period began with wooden hulls, side wheel propulsion, side lever or oscillating engines, rectangular return flue boilers, salt water feed, jet condensers, 10 to 12 pounds steam pressure and 4 to 5 pounds of coal per brake horsepower per hour. We have already described the California (1850), on which all of these features were present. Before 1860, American practice had dropped the side lever engine in favor of the overhead beam as a mechanical means of transmitting the reciprocating motion of the piston to the crank of the paddle wheel shaft.

The steamer Colorado, a sidewheeler of 3738 tons, started the China service of the Pacific Mail in 1867. The service was augmented by the Great Republic and China, both wooden sidewheelers, which each made a round trip in 1867. There were five round trips in 1867, nine the following year, and twelve in 1869. The New York and Japan were added to this service in 1868, and the America in 1869. The sidewheelers Alaska and Arizona were added in 1871, and a bi-monthly service started the following year.

The largest of the old wooden side wheel paddlers was the America, built for the transpacific service of the Pacific Mail Steamship Company by H. Steers, of New York, in 1868. Her principal characteristics were:

Length	380 feet
Beam	50 feet
Depth	32 feet
Tonnage	4454.09 gross
Engine horsepower	2000

She was built of oak and cedar with copper and iron fastenings, and had an overhead beam engine. A contemporary newspaper account says that she was built with five decks and had accommodation for 400 first class, 800 second class, and 1500 steerage passengers. These numbers, if authentic, illustrate the advance in travel comfort. The total shows a capacity somewhat greater than the published figures for the great Queen Mary.

S. S. America was hailed as the finest product that had ever been turned out in an American shipyard, but her life was short and her end disastrous. On August 24, 1872, the day after her arrival at the harbor of Yokohama, she was burned with a loss of 60 to 70 lives and the total loss of hull and a valuable cargo, including $1,600,000 Mex in specie.

This fire and its costly aftermath directed the attention of the Pacific Mail Steamship Company to iron as a shipbuilding material, and after 1874, the new vessels for their Japan-China service were all of that material. The larger iron steamers of the seventies for American lines on the Pacific Coast were mostly built at the famous yard of John Roach, at Chester, Pennsylvania.

The first iron steamers to appear in the fleet of the old Pacific Mail Steamship Company were the Acapulco, of 1759 tons; Colima, of 3836 tons; and the Granada, of 1759 tons; these steamers coming to the coast in 1874. The next items on the building program of this company were the City of Para, the City of San Francisco, City of Panama, and City of New York, all between 2,000 and 2,500 tons register, and all arriving for the first time in 1875. The City of Peking and the City of Tokyo, of 5080 tons each, and built by John Roach, arrived in 1876, and the City of Rio de Janeiro, of 3548 tons, in 1881. The famous steamer China, one of the best known and certainly one of the handsomest steamers that ever plied the Pacific, was not built for the Pacific Mail, but was purchased by that company. She was built in England in 1889, and completed her hundredth trip to China in 1911.

In 1878, John Roach finished the Rio de Janeiro, which he sold to the Pacific Mail Steamship Company. This vessel was remarkably sharp. Her dimensions were: length between perpendiculars, 344 feet; beam molded, 38 feet; depth molded, 28 feet, 9 inches; gross measurement, 3548 tons; and net measurement, 2275 tons. She had seven water-tight bulkheads and three full decks. Her power plant was a triple expansion engine with cylinder diameters 28 inches, 44 inches, and 70 inches, with 48-inch stroke. Six cylindrical fire tube boilers 12 feet, 7-inch diameter, and 11 feet, 6 inches long, supplied steam at 125 pounds pressure. The Rio ran across the Pacific acceptably for twenty years. Then she did transport duty during the Spanish war and then returned to passenger service until February 1901, when she sank in the Golden Gate in one of the most publicized disasters in American marine history, leaving no trace of ship or cargo, and only a few survivors among passengers and crew.

The steam plant as described above was installed in this vessel by the Union Iron Works, of San Francisco in 1895. Her original plant was a twin compound engine with cylinders 42-inch and 74-inch in diameter by 60-inch stroke, taking steam from a return tubular boiler installation at 90 pounds gauge pressure.

● Electric Light and Bath Tubs

In 1871, the White Star Line took delivery of the steamer Oceanic from the Belfast yard of Harland & Wolff. This vessel is considered by all authorities to be the mother of all modern passenger liners. She was the first vessel to have bathrooms installed and the first to locate passenger accommodations amidships. Her bath-

The famous Pacific Mail transpacific liner Rio de Janeiro. This picture was taken on her return from the Philippines as a transport bearing American troops returning from the Spanish war.

tubs were three in number; one in the barber shop, one in a small room entered from the corridor just outside the barber shop, and the third in the ladies' bathroom on the opposite side of the ship. All three baths were in charge of the barber.

Principal characteristics of S. S. Oceanic were:

Length overall	432 feet
Length B. P.	420 feet
Beam molded	40.9 feet
Depth molded	23.4 feet
Net measurement	2440 tons
Gross measurement	3808 tons

She was a four-decked single screw steamer rigged as a four-masted ship. Her engines were double compounds with each high pressure cylinder mounted on top of its low pressure cylinder—two cranks, four cylinders. Her surface condenser had 3,500 tubes. The engines took steam at 65 pounds gauge pressure from ten upright oval boilers, each of which was 13 feet 8¾ inches high, 8 feet 6 inches broad, and 9 feet 10 inches long. Each boiler had two furnaces, the grates being 3 feet 2 inches wide and 6 feet 6 inches long.

In November, 1874, the Occidental and Oriental Steamship Company chartered the Oceanic, the Belgic, and the Gallic from the White Star Company and began a competitive service across the Pacific. The first of these vessels to arrive at San Francisco was the Oceanic, on June 29, 1875, twenty-four days from Hongkong. Thus was the new idea of bathtubs aboard ships introduced to the Pacific Ocean traveler.

The Oceanic and her two companion vessels maintained this competitive service very acceptably for several years.

Another pioneering steamer of that day was the Columbia, built by John Roach in 1880 for the Oregon Railway and Navigation Company. Columbia was 334 feet long overall, 38.5 feet beam, single screw, brigantine rigged, with compound engines 42.5-inch by 82-inch diameter of cylinders with 4.5-feet stroke, taking steam at 80 pounds pressure from 6 Scotch type marine boilers.

While she was outfitting at New York, Villard, the president of Oregon Railway and Navigation Company, contacted Thomas Alva Edison, then just beginning to perfect his incandescent lamp and constant potential generator. Villard ordered Edison to equip his new steamer with the new lamps. Edison installed two of his new generators, belt driven from a small steam engine, wired the ship completely, and installed lamps in all her compartments. This was the first installation of its kind afloat or ashore, and the practical success of the installation on the long passage round the Horn from New York to Portland, Oregon, as attested by the chief engineer of the Columbia, was used by Edison to overcome the prejudice against his new invention.

● Passenger Accommodations in 1880

We have already referred to the famous steamer, City of Rio de Janeiro, a vessel considered very elegant when she was built by John Roach in the late seventies. This vessel, with her sister, the City of Para, was built by Roach for his great scheme of a mail line between New York and Brazil. This, like many another brave American maritime venture, failed for lack of government assistance, and the ships were sold to the Pacific Mail Steamship Company.

The following description of their public rooms and passenger quarters is taken from contemporary press reports:

The passenger capacity was 100 first class and 400 steerage. Commodious rooms for captain and officers were arranged on the hurricane deck, and there was also at that level a large smoking room "richly furnished with lounge seats and circular tables." The first-class saloon was a "sumptuous and commodious apartment 130 feet long by 30 feet wide, having 3 rows of tables over 60 feet long, with shifting back sofa chairs, and a range of sofas along the walls,

The coastwise passenger and cargo steamer Columbia, shown here, was the first vessel in the world to be lighted with electric incandescent lamps. Her installation of Edison generators and lamps was the first demonstration of Edison's new invention outside of Menlo Park, N. J.

In the eighties and nineties of last century, many steam whaling ships operated out of San Francisco and Pacific Northwest ports. Our illustration shows the Narwhal, built in San Francisco in the eighties. Like many other vessels in this business, she was so arranged that her propeller could be drawn up into a well in the hull so as not to interfere with her sailing ability.

all upholstered in rich crimson velvet." This saloon was lighted and ventilated by 52 rectangular sliding windows each 26 by 20 inches, and 6 large skylights fitted with ornamental glass framed in mahogany. "The ceiling of this spacious and beautiful saloon was over 8 feet from the floor to the underside of the deck beams, and the floor was of oak inlaid with black walnut." Rich carpets covered the floor, and the walls were paneled in Hungarian ash and French walnut interspersed with plate glass mirrors, all being framed in Honduras mahogany mouldings. The stairways were of highly polished native and foreign hardwoods, and each newel post was surmounted by a bronze figure carrying a lamp.

Staterooms for the first-class passengers were on the hurricane deck and on the spar deck aft of the saloon, and were "not only commodious, well lighted, and fully ventilated, but furnished in a style of luxurious comfort. All berths were fitted with rich lambrequins and lace curtains. The saloon, ladies' cabin, smoking room, and each individual berth in the first-class department, were supplied with electrical annunciators communicating with the steward's department. The after part of the main saloon was the ladies' boudoir, and had a bathroom supplied with hot, cold, and sea water. The barber shop amidships on the spar deck had two bathrooms complete in their appointments. "

Steam heating of passenger quarters, artificial ventilation, and mechanical refrigeration, all operated by steam, were just beginning to appear on shipboard by 1880, and a great deal of thought was given at that time to all the basic problems of sanitation and comfort in passenger quarters aboard ship.

We have already noted the pioneer work of Worthington in separating the feed pump from the main engine. On the Rio de Janeiro and other passenger steamers of 1880, we find that the main engine is devoted solely to turning the propeller. A "donkey" boiler is provided for working all of the steam drive machinery that might be needed while the vessel is in port or under emergency conditions, such as deck winches, capstans, windlasses, and bilge, ballast, sanitary or feed pumps. Under way, these separate steam engined units took steam from the main boilers direct or through a reducing valve, as is the custom today.

● Steam Expansion—1880-1900

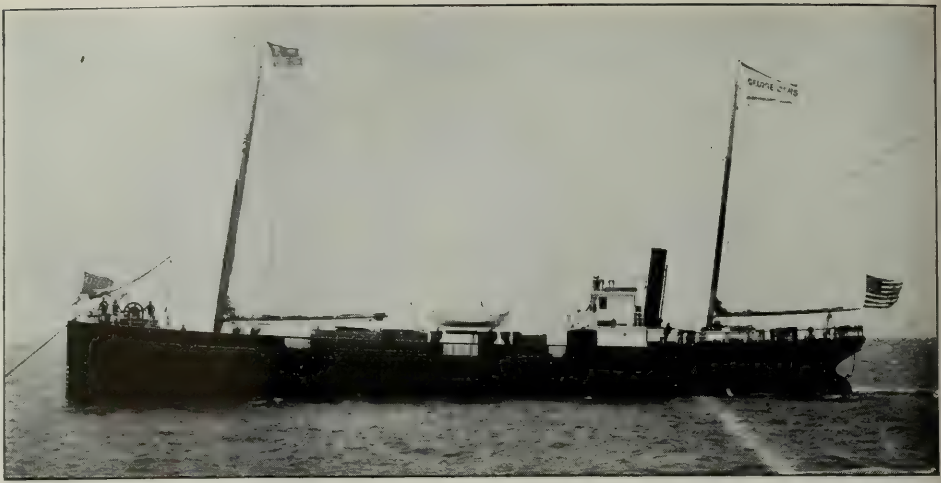
As we have already noted in our survey, the power plants of the advanced steamers of 1880 contained in crude form all of the ideas that expanded into the highly developed and economical steam prime movers and auxiliaries of the modern steamship. Pressure was generally at or near the 100-pound level. Fuel economy was around 2.25 to 3 pounds of good steaming coal per indicated horsepower per hour. The Scotch marine fire tube boiler, and the compound steam engine in a great variety of forms, were universal in the best merchant practice for ocean-going steamers. Propellers had practically displaced side wheels for long ocean voyages. Froude had started towing experiments with model hulls to determine the best characteristics of form. Much experimental design work on propellers was already bearing fruit in better propulsive efficiency. In short, the stage was all set for a steady improvement in naval architecture and marine engineering.

So in the last two decades of the 19th century we find a great expansion in the use of steam on the Pacifice services, hitherto reserved for wind power and the white wings of the sailing ship.

It is significant in this conection that the first cargo steamer to engage in the direct Europe-Pacific Coast trade arrived in San Francisco in 1881 with 2,000 tons of steel rails, brought out on a premium freight rate of $16.75 per ton because of the rush to get rails laid in certain railroad work. This was a very special case, and all the shipping experts of the time were busy proving that this steamer, the Monarch, would not be able to compete with sailing ships at the general level of ocean freights then prevailing. This was evidently a correct deduction, since it was some 18 years later that intercoastal steam services were finally established.

In this conection it must be constantly borne in mind, when appraising the progress of steam navigation on the Pacific Coast, that the principal exports up to very recent years were lumber, wheat, barley, and the precious metals. The bulk of this export went to Europe, and was carried mainly in sailing ships until after the opening of the 20th century. In fact, the sailing ship, for such cargoes, was generally in use on long voyages until the introduction of oil fuel on steamers.

Many an old timer in San Francisco will recall with a sigh the splendid three- and four-stickers that thronged the harbor in the eighties, waiting for barley and wheat—ships from all nations—all seas—to fill with golden grain from the fertile valleys of the golden state —often 100 or more crowding the piers or swinging in the stream. From July, 1872, to July, 1888, a period of 16 years, 4,696 vessels, with a total registered gross measurement of 6,001,400 tons, cleared from San Francisco with flour and grain, exclusive of shipments on regular steamship lines. This combined fleet embraced 1,421 American vessels of 2,183,900 gross tons, 2,864 British vessels of 3,438,900 gross tons, and 411 other foreign flag vessels of 378,600 gross tons. The largest number in any one of those 16 years was 559, in 1881, of which 149 were American, 345 British, and 65 of other foreign flags, including German, French, Russian, Dutch, Italian, Norwegian, Swedish, Austrian, Peruvian, Nicaraguan, Honduran, and Hawaiian. As late as 1902-03, San Francisco cleared 137 vessels with grain, of which 84 sailing ships were direct to Europe round the Horn, the shortest passage being 104 days.



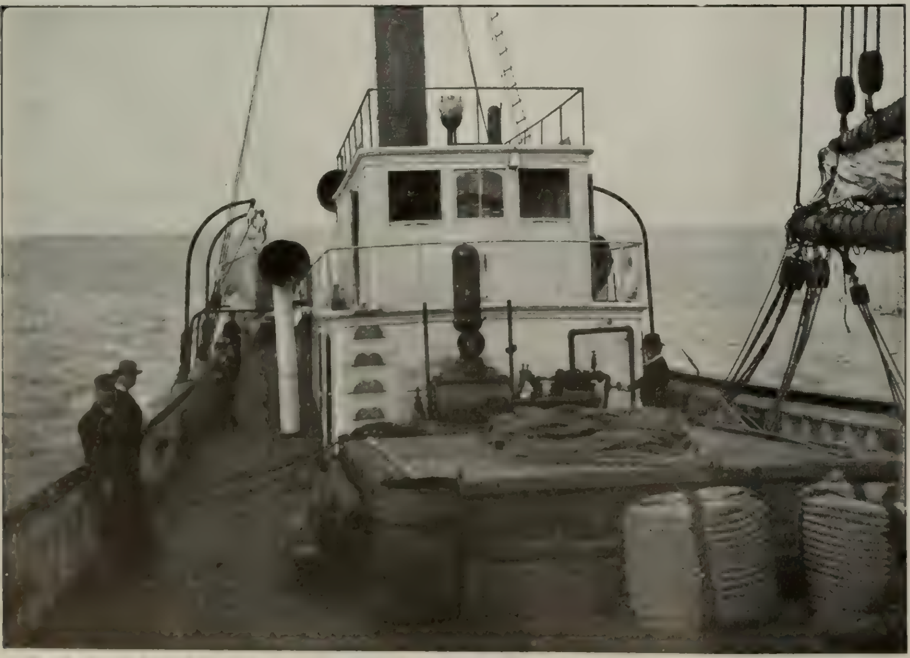
One typical development of this period was the introduction of steam power in the coastwise lumber trade. Much of this trade was carried by schooners of shallow draft, and many of these vessels were converted to steamers, giving rise to the term "steam schooner." Since the principal lumber cargo on schooners was the deck load, it followed that, in conversion to steam power, these vessels were given a raised forecastle and a raised poop, the former to house the crew and ships' stores, the latter the officers and machinery, leaving a deep welled waist ideal for the deck load. Very recent improvements of harbors in the lumber shipping outports has allowed larger steamers to displace many of the steam schooners, but for at least a quarter century the great bulk of the coastwise lumber transport was handled by this type of vessel.

Another notable product of this period was the triple expansion steam engine. Brought to its practical form in 1881 by Kirk in Great Britain, this engine almost immediately took hold of the shipowner's imagination, and by 1890 practically every ocean going steamship built was to be propelled by a reciprocating triple of three or more cylinders. In the larger powers, quadruple and even quintuple expansion appeared before the end of the century.

This was the period of Oriental awakening. Several Chinese steamship companies were formed, and practically all the large Japanese steamship firms now operating date back to these twenty years.

Steam whaling was another outgrowth of the steam expansion period. Twenty-six steamers were engaged in whaling on the Pacific Coast in 1881, and by 1893 that number had been increased to fifty. Most of these vessels were built in San Francisco yards. They were equipped with sail as well as steam, and several had a well fitted over the stern so that the propeller could be unshipped and drawn up when it was advantageous to use sail power.

This period also witnessed the advent of the steam turbine for marine propulsion. As early as 1892, Carl Gustaf Patrick De Laval had designed, built, and installed a 15-



In the nineties of last century, transport of oil by sea began to assume large proportions. On this page, we show the first Pacific Coast tanker, S.S. George Loomis, built at the Union Iron Works, San Francisco, in 1896. The deck scene on this ship, and her general appearance, give a good idea of the progress made in tanker design in the past forty years. This vessel had a triple expansion engine and a Scotch type marine boiler, and carried 6,500 barrels of oil at 9 knots sea speed.

horsepower marine turbine with a reverse element and a speed reduction gear. He developed the helical gearing for high-speed work, and turbines, gears, and pumps bearing his name are in wide use today on many Pacific Ocean steamers.

By 1900 transpacific steamers had become floating palaces of great size, beauty, and power. Two types will suffice as examples. First, the original Empresses of the Canadian Pacific services, built in 1890 at the Vickers yard in England; and second, the Siberia and Korea, built in 1899 at Newport News Shipbuilding & Dry Dock Company for the Pacific Mail.

The Empresses (Japan, China, India) had the following principal characteristics:

Length O. A.	485 feet
Length B. P.	440 feet
Beam	51 feet
Depth	36 feet
Height, top of keel to upper deck beams	39 feet, 10 inches
Gross measurement	5,920 tons
Total deadweight capacity	4,000 tons
Hull	Steel
W. T. bulkheads	13
Propellers	2
Total power	10,000 I.H.P.
Sea service speed	17 knots
Trial speed	19 knots
Boiler pressure	165 pounds
Fuel consumption (trial)	1.6 pounds per I. H. P. hour.

They had a coal bunker capacity of 2,000 tons. With their yacht-like clipper bows, fine sheer and rake, spike bowsprits and overhanging counters, these vessels, in gleaming white hulls and yellow funnels, were the handsomest things afloat in their day. They were naval reserve ships fitted to take armament, which was kept in store for them at Vancouver and Hongkong, and with their high speed and great cruising radius, they would, if called upon, have been very useful to the British navy.

The passenger accommodation provided capacity for 200 first-class, 60 second-class, and 500 steerage passengers, with conveniences and luxuries equal to any ships then afloat.

The two American steamers Korea and Siberia, ordered in 1899, were delivered to the Pacific Mail Steamship Company by the Newport News Shipbuilding and Dry Dock Company in 1902. Since they represented fifty years of experience in Pacific Ocean steam navigation and were, at the turn of the century, the largest ships ever built in an American shipyard, they are of great interest to the student of steam navigation development. The principal characteristics follow:

Length O. A.	572 feet, 4 inches
Length B. P.	550 feet
Beam molded	63 feet
Depth molded	40 feet
Block coefficient	0.69
Gross measurement	11300 tons
Net measurement	7285 tons
Load displacement	18400 tons
Cargo capacity	510466 cu. ft.
Coal bunkers	2583 tons
Tank capacities:	
Forward peak	225 tons
Aft peak	271 tons
Double bottoms	2124 tons
Deep well	526 tons
Propellers	2
Diameter	19 feet, 6 inches
Pitch	25 feet
Hull	Steel
Watertight bulkheads	16
Passenger capacities:	
First-class	200
Second-class	60
Steerage (Chinese)	1200
Crew	236

The power plant for the Korea and the Siberia is of especial interest, and several of her auxiliary machinery items bear names that are prominent today in nearly all American shipbuilding contracts.

Propulsion machinery consisted of two quadruple expansion, four cylinder, four crank, vertical inverted engines having cylinders of 35, 50, 70, and 100 inches diameter by 66 inches stroke. At 89 revolutions a minute, these engines, on trial, had a combined output of 17,900 I. H. P., which drove the ship at 20 knots. Crank shafts were 19½-inch diameter, thrust shafts 19-inch, line shafts 18¾-inch, and propeller shafts 19½-inch, all hollow steel forgings with 6-inch diameter center hole.

The engines were fitted with a steam float-lever reversing gear fitted with hydraulic control cylinder. All cylinder valves were of the piston type. The throttle valves were of the balanced type, operated through levers by wheels at the working platform. The throttle was also controlled by a Westinghouse overspeed governor. Main steam pipes were of seamless drawn steel, and receiver pipes of copper. Propellers were of the built-up type, with cast steel hub and manganese bronze blades.

The rudder was of cast steel in one piece, swinging on six pintles, but with its weight entirely supported on a large bronze bushed thrust bearing on the main deck.

Steam was generated at 200-pound gauge in six double end and two single end Scotch marine boilers. The double end boilers were 16-feet diameter, 20 feet 3 inches long. Each had eight 40-inch corrugated furnaces, and 1,152 two and a half-inch tubes providing 6,416 square feet of heating surface and 153 square feet of grate surface.

Although the tops of the stacks were 108 feet above the grates, the boiler rooms on these ships were arranged to be operated on the Howden forced draft closed stokehold system, with thirteen 60-inch blowers each run by a separate direct connected 4 x 5-inch double steam engine. Air preheaters were installed in the uptakes.

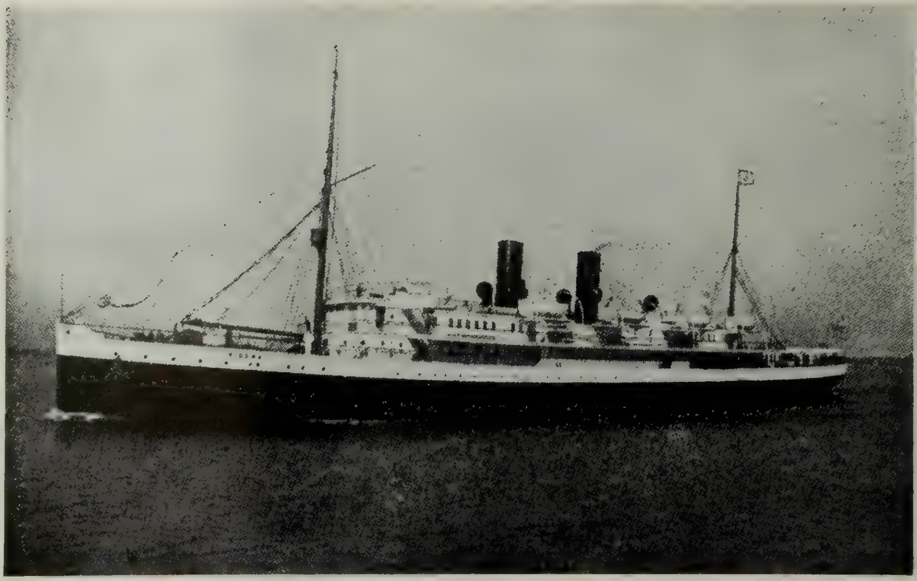
Each main condenser had 11,787 square feet of cooling surface and was served by two centrifugal circulating pumps driven by compound steam engines 11 x 20 x 10 inches, and having a capacity of 6,080 gallons per minute each. These were installed by Blake, who also furnished the other auxiliary pumps.

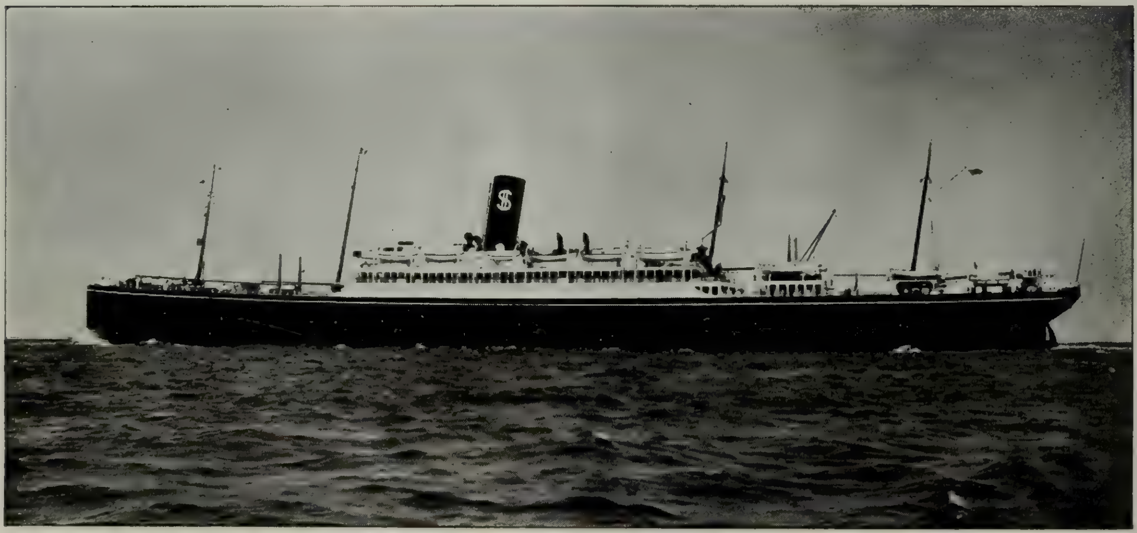
Steering gear, cargo winches, capstans, and windlass were furnished by the Hyde Windlass Company.

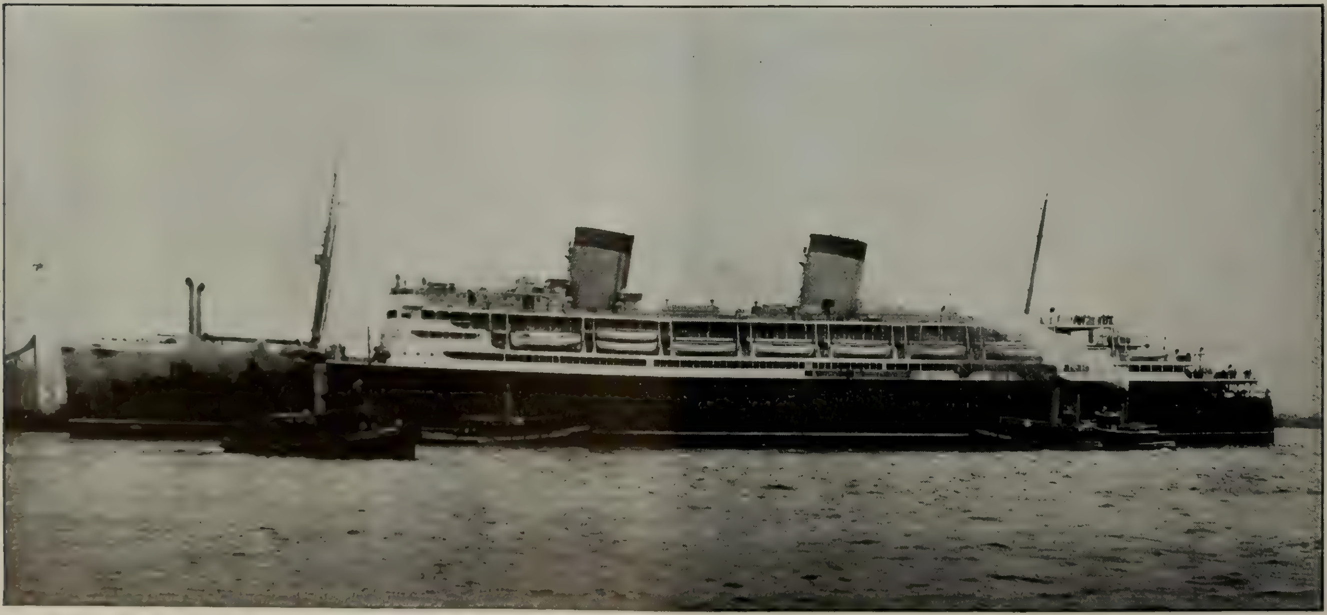
Much space in the contemporary technical press is given to the refrigeration plant of these ships. It consisted of two special 8-ton refrigerating machines, each including a compound stern cross connected for tandem or independent operation. Each of these units had capacity for operating the brine tanks and cooling coils, which took care of 1321 square feet of floor space in insulated chambers for ships' stores and refrigerated cargo, and at the same time made 1,200 pounds of ice a day, and cooled two 15-gallon drinking water coolers. The refrigerating plant was supplied by the Vulcan Iron Works, San Francisco.

The electric load was comprised of a searchlight on the bridge, 820 incandescent lights throughout the ships, and two 5-horsepower electric motors for driving the two Sturtevant blowers ventilating the passen-

The cargo and passenger steamship Sierra, shown at right, was built by Cramp's for the Oceanic Steamship Company in 1900. Two sister ships, Ventura and Sonoma, were contracted for at the same time. These vessels were driven by twin screws, and triple expansion engines taking steam at 175 pounds from Scotch marine boilers. Below is the President Johnson, formerly the Manchuria, built by the New York Shipbuilding Company for the Pacific Mail in 1904, and powered with two quadruple expansion engines and Scotch boilers generating steam at 215 pounds pressure.

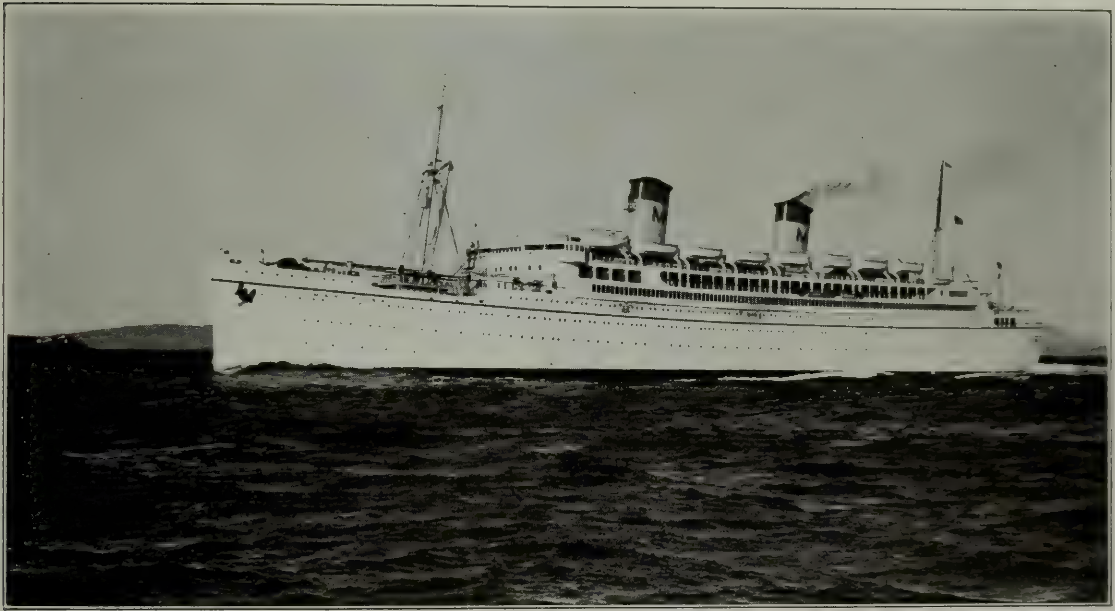






The Matson turbine passenger liner Malolo, built by Cramp in 1926, powered with Cramp-Parsons turbines through De Laval single reduction gears. Steam from Babcock and Wilcox water tube boilers at 280 pounds gauge pressure.

The Matson liner Maui, at right, was a great favorite in the Honolulu run after her delivery by the Union Iron Works of San Francisco in 1917. Powered with Westinghouse single reduction geared turbines and Babcock and Wilcox water tube boilers generating steam at 265 pounds pressure. Below: Passenger liner Mariposa, of the Oceanic Line, jumps to 375 pounds boiler pressure and 650 degrees Fahrenheit steam to drive her Bethlehem-Parsons single reduction geared turbines.



The Grace liner Santa Rosa has General Electric double reduction geared turbines with Babcock and Wilcox water tube boilers generating steam at 375 pounds pressure, 750 degrees Fahrenheit.

S.S. California, of the Panama Pacific Line, was the pioneer electric drive passenger liner. Together with her younger but slightly larger sisters, S.S. Pennsylvania and S.S. Virginia, she has made a wonderful demonstration of the popularity of electrically operated passenger vessels. All three have General Electric turbine driven generators and propulsion motors.

The Dollar passenger and cargo liner President Coolidge is the latest and most modern electric drive vessel in the American Merchant Marine. She is powered with Westinghouse steam turbine driven generators and Westinghouse propulsion motors.

British Steam Progress on Canadian Australasian Route

The three illustrations on this page cover 28 years of steamship design in the Union Steamship Company of New Zealand. Above is the S.S. Mararoa, built by Denny Brothers, Dumbarton, in 1885 and said to be the first triple expansion engine in transpacific service.

Above: S.S. Maheno, built by Denny Brothers in 1905 with triple screws driven by turbines. The first transpacific turbiner. At right: S.S. Niagara, the first combination reciprocating and turbine plant on the Pacific Ocean. Triple expansion engines on the two side shafts exhausting into a low pressure turbine on the central shaft. 220 pounds pressure, 17.3 knots. Built by John Brown, Clydebank, in 1913.

ger quarters. Two General Electric six pole generators, each driven by a tandem compound 7½ x 12½ x 6-inch direct connected steam engine, were installed on the main deck abreast of the engine room and just forward of the refrigerating machinery room. Each of these sets could carry the entire load.

The Korea and Siberia were promptly followed, in 1904, by two larger steamers, Mongolia and Manchuria, for the Pacific Mail, with a length of 615 feet, 8 inches, and a gross measurement of 13,635 tons; and by the Minnesota and the Dakota for the Great Northern Steamship Company. The two latter were each 630 feet long, 73 feet beam, and 54 feet, 6 inches molded depth, with a gross measurement of 21,000 tons, a net of 15,000 tons, and 33,000 tons displacement. Twin screw ships intended for 14 knots sea speed, they were each fitted with 16 Nieclausse water tube boilers furnished by the Stirling Company, and two triple expansion 3-cylinder engines 29 x 51 x 89-inch cylinders and 57-inch stroke, each generating 5,000 I. H. P. at 78 revolutions per minute, with gauge pressure of 250 pounds.

These vessels made a notable stride in the use of electrically-operated auxiliaries. The auxiliary power plant consisted of six 75-kilowatt, 110 volt, Westinghouse generators each directly driven by a Westinghouse compound vertical single-acting steam engine 11 x 19-inch cylinder diameters and 11-inch stroke.

Distributed throughout the ship were 1,300 incandescent lamps, and on the forward bridge a powerful 24-inch General Electric searchlight. The following auxiliary machinery was operated by electric motors as indicated:

Two 30-ton American Linde ammonia compressors, each driven by a 75-horsepower General Electric motor;

Seventy-two blowers and exhaust fans, the blowers arranged to supply either heated or cooled air, and each independently driven by a Westinghouse motor;

Two warping capstans, each driven by a General Electric motor;

Twenty-six 3,000 - pound capacity Lidgerwood cargo winches, each driven by a General Electric 25-horsepower series wound armored motor;

Eight 5,000-pound capacity Lidgerwood cargo winches, each driven by a General Electric 40-horsepower series wound armored motor;

And one 7,000-pound, two 10,000-pound, and one 14,000-pound Lidgerwood cargo winches with suitably powered General Electric motors.

The auxiliary condensers were supplied by the Wheeler Condenser and Engineering Company.

● Twentieth Century Steam

After 1900, the principal features of marine steam development on the Pacific Ocean were connected with the more general introduction of water tube boilers, the commercial introduction of the turbine drive, and the commercial use of oil as a fuel under marine boilers. All of these trends received a great impetus through the competition of the diesel engine, with its inherently very low fuel consumption. Beginning the century with fuel economies around one and a half pounds of coal per indicated horsepower hour as a high mark for good practice, with 200 pounds of steam, the marine engineer was soon able to make one pound of oil produce the I. H. P. hour at that same pressure. Then with water tube boilers and turbines, the pressures and superheats began to rise, so that today 350 to 400 pounds with 700 degrees Fahrenheit is almost the rule on new ships, and fuel consumption has dropped to below 0.6 pound for the best practice.

As the pressure goes up the space and weight per horsepower go down, and so in many ways the steamer becomes a more economical transportation unit. For Pacific Ocean ships there is a tremendous range of steam pressures yet to be explored. We have gone to 425 pounds. The Germans have already gone to 1,320 pounds, and it is practicable to go to the range between 3,000 and 4,000 pounds. Steamers whose hulls and equipment are designed especially to take advantage of all the favorable factors possible in high pressure steam will show remarkable overall economies.

The story of this 20th century development on the Pacific Coast is told by the pictures illustrating this article. It has been largely an adaptation of standard marine steam practice to the special requirements of particular Pacific Ocean services. Long sea lanes, great distances between adequate harbor, docking and repair facilities, and keen world competition have forced on the Pacific steamship operator an ultra-conservative attitude toward new ideas in marine engineering. Notwithstanding this attitude, great progress has been made, and the modern steam fleet on the Pacific is composed of ships that have few peers in their class among the steam vessels of the world.

The ship's engine room is a vastly different place today from what it was a century back. The swish of the water jet and the clatter of the doctor have given place to the silent efficiency of the steam injector and the motor or turbine driven centrifugal pump. Coal dust, hot well vapor, smoky oil lamps, clanging bells, intolerable heat, unbreathable atmosphere—all these replaced by clean, quiet efficiency through the benefits of modern electrical and metallurgical science and modern mechanical perfection. The long sough of the 10-foot stroke changes to the soft drone of the sweetly balanced, perfectly adjusted turbines. The swinging jolt of reciprocating masses has become the low purr of precision cut helical gearing or the sweet hum of generator and motor. Closed feed systems, and modern control of water content and of oil combustion, insure reasonably perfect steam conditions. Closed forced feed lubricating systems, in connection with mechanical oil purifiers, assure clean, well-lubricated bearings. A well-kept engine or fire room on a modern steamer is a much cleaner, more inviting place to live in or with than were even the first-class passenger quarters on the Pacific Ocean steamer of 100 years ago.

But with all of this material improvement in marine steam plants, let us not forget the debt we owe to the marine engineers of those early days, who wrought so valiantly with their inadequate equipment, who poured out their physical energy so lavishly in superhuman labor, and who bore for at least a generation the scorn and ribald sarcasm of sailing ship owners and officers. Their heroism made possible what we enjoy today, and these modern beauties steaming so gracefully and easily across the broad Pacific today are but monuments to the courage of those pioneers in steam.

Some Purse Seiner Difficulties

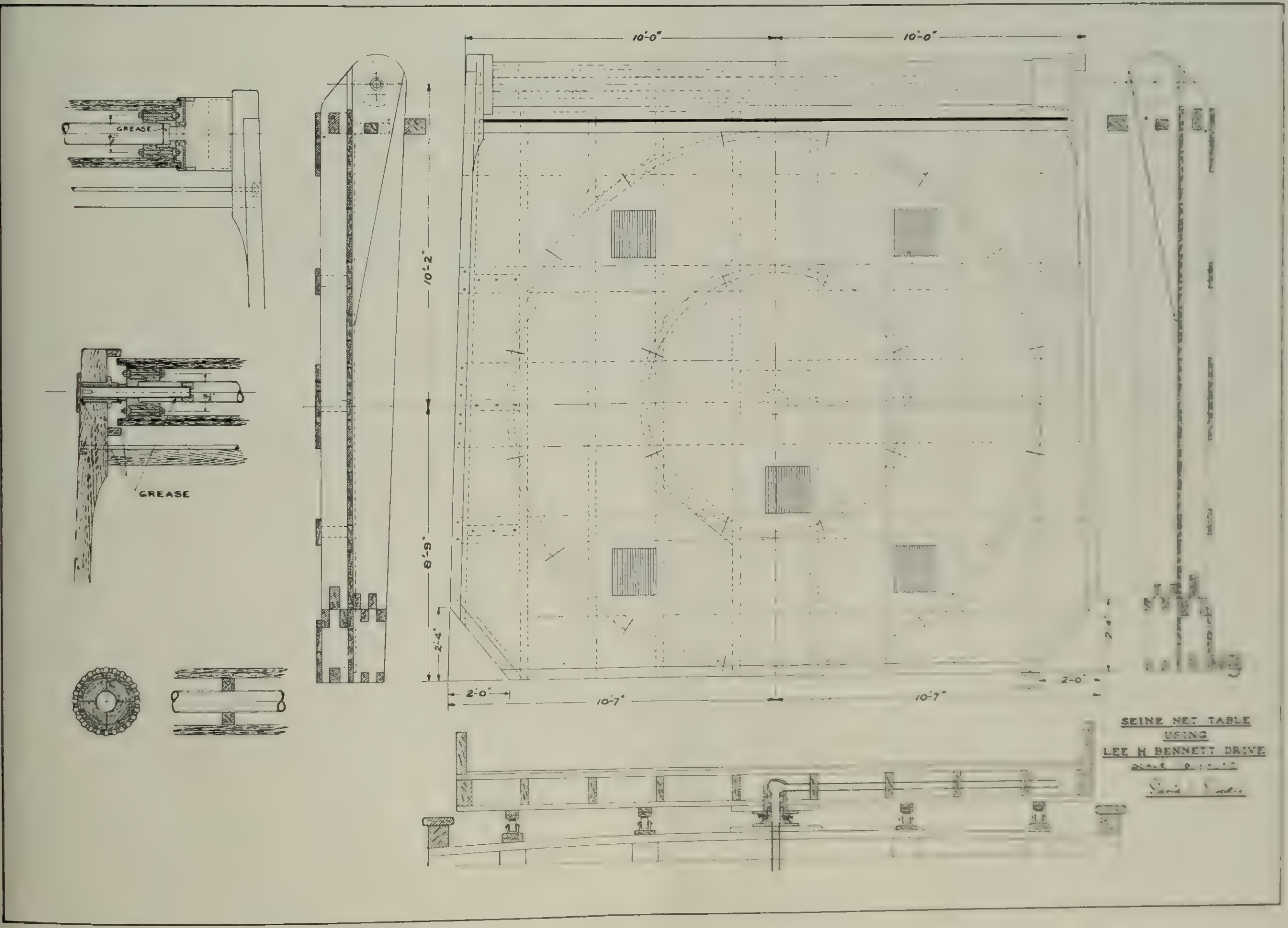
By David W. Dickie

An executive of one of the fishing companies gave the writer a list of troubles that have been characteristic of the purse seiners; some of them existing on all, and others being present on some of the boats only. The question was—Can they be eliminated?

The rudder, rudderstock and steering gear of merchant vessels are built according to the rules of the American Bureau of Shipping and similar Classification Societies and the rules can be applied to the larger purse seiners. When these items are designed to comply with the rules all the troubles are automatically eliminated. The rudder stock will be larger in diameter, the steering chains will be heavier and more substantial steering gears required. On account of lack of space for the large gears it is better to put the steering drum horizontal under the pilot house floor instead of in the pilot house as at present and as the larger gears require larger shafts the trouble with the keys and keyways disappears. When the boats are anchored in Monterey Bay in the heavy ground swell, the shock of the constant slamming of the rudder is taken up by the two spring shock absorbers that are required for the merchant vessels. The steering gears now used are neat and well made but they are not massive enough to satisfy the requirements of the rules that have been formulated through many years of experience on all classes of vessels. The quarter blocks should be fitted with metaline bushings and metaline discs under the sheaves and be connected to the alemite system under the net table.

● Hull Distortion

When the boat is in the light condition going out to the fishing grounds, the machinery is in one end of the boat, the fuel tanks are in the other and the fish hold between is empty. The result is that the boats bend up in the center. When this bending takes place the straining of the structure of the boat tends to pull a short piece of the boat at the bow and the stern in an upward direction. When the boat is loaded it tends to bend down in the center

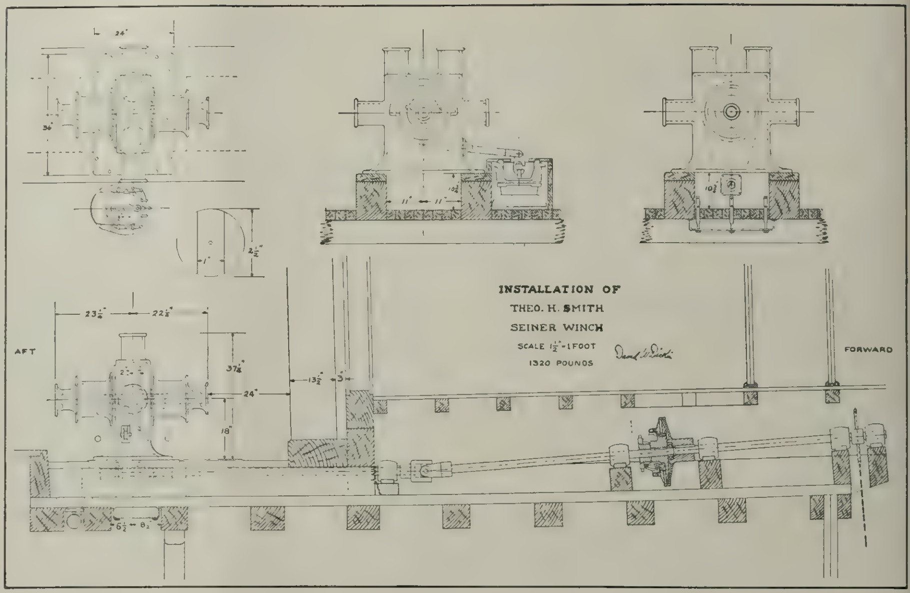


and the straining of the structure tends to pull a short piece at the bow and stern downward. If we bend a piece of pipe over the knee it will be found that the pipe flattens at the point of flexure. Exactly the same condition prevails in the boats and the cross section of the boat at the point of greatest bending is distorted so the keelsons and deck draw together or toward each other. The boats are not built strong enough to withstand the stresses put upon them and the writer found that he had to add over three tons of material and fastening to the design he made to take care of the strains. At a later date it may be possible to publish an article illustrating how the stresses come on the structure of the boat and show what strains are set up.

It is sufficient to say at this time that the distortion of the structure of the boat comes at locations that are exceedingly severe on the operating mechanisms of the deck machinery. This has caused trouble with the clutches. On five different visits to the purse seiners to see how these stresses affected the gear there were clutches being brought ashore to be repaired and on one occasion the entire drive of the net table was dismantled for repair. On finished boats the necessary strengthening cannot be built in so the operating mechanisms have to be designed to permit a certain amount of bending.

The clutches will have to be larger in diameter and of a design similar to the Twin Disc Clutch. Single plate clutches are free to move when bending occurs in them and the shafting should be mounted on self aligning ball bearings. Single roller chains should be used as the distortion causes double roller chains to run out of true.

The trouble with the line shaft from the main engine to the propeller is caused principally by the distortion of the hull in way of the fish hold due to flexure at the point of greatest bending moment. Trouble from this cause appears also at the stuffing box on the forward bulkhead of the fish hold. It can be alleviated by installing a stuffing box at one-third of the distance from the coupling of the main engine to the shaft log instead of on the forward bulkhead and building a watertight shaft alley from this stuffing box to the forward bulkhead of the fish hold. While this is good practice in any of these boats it will not add strength to the structure of the boat as a whole. It merely leaves the coupling of the main engine free to move with respect to the fish hold bulkhead.



● Cargo Winch

The Theo H. Smith Machine Works Anchor Windlass and Cargo Winch are substantially built but in some cases have not been properly installed to avoid the troubles produced by the foregoing factors. Installation of the cargo winch is very important and a sketch of it is shown in the figure. Here we have the bulkhead at the end of the cargo hold, the after end of the house, the mast and the distortion of the cross section of the ship to contend with, the stresses going in different directions. The chain drive comes up from the fore and aft shaft under the engine room floor to the sprocket wheel on the forward end of the winch shaft which permits a certain amount of movement at this point.

To overcome the other strains the writer installed two heavy timbers from the fore end of the hatch to the forward bulkhead of the cargo hold upon which are mounted the cargo winch, mast, end of the house, shaft bearings and clutch. The clutch is a single plate Twin Disc Type to permit the bending to take place in the clutch. Under the main deck is a heavy arch stanchion carried down to the keelsons to absorb the distortion stresses. The cargo winch has been raised 10¾ inches above the deck to provide the correct distance between centers of the chain drive, the proper height for the pump drive and space under the shaft to accommodate the diameter of the clutch. A removable pan is fastened below the main deck to provide access to the lower gear. Everything is clear of the fish in the fish hold and a hatch in the floor of the cabin permits the clutch to be cared for. All bearings are piped with copper tubing to an Alemite inlet on the side of the winch.

● Net Table

On most of the boats at present the center drive for the net table is taken off by a chain from the cargo winch drive to a clutch and shaft which runs aft in the fish hold to a cross chain drive aft of the after bulkhead of the fish hold. A set of bevel gears above and below takes the drive up through the king pin of the net table and by means of a cross shaft and sprocket chain is taken to the jaw clutch on the roller. The distance from the bottom to the top of the wood construction between the supports of the bevel gears at the king pin is 19 inches approximately. As the bevel gears should be firmly keyed to the vertical shaft they get into trouble when the wood shrinks one-quarter of an inch to the foot or about ⅜-inch shrinkage in the 19 inches.

Some salt water gets into the kingpin even if properly designed with the result that in a short time parts of the drive are rusted solid. In the first design of the net table using the Theo H. Smith patterns the writer put a spur gear on the bottom of the vertical shaft and an idler above the lower horizontal bevel gear so the vertical shaft was free to move as the shrinkage took place.

The net weighs about 5 tons when wet and the heavy weights are distributed at the corners of the net table where there is no support below. The design of the net table shown has been strengthened to take the load and to take all types of drive without having the floor obstructed by boxes covering shafting, pipes or rods. To do away with—the chain drive to the clutch, the clutch itself, the shaft through the fish hold, the chain drive to the gear below, the shafting, gears and sprocket chain to the roller and the clutch on the roller,—a Lee H. Bennett water turbine drive is shown. This is mounted on the side of the net table at the end of the roller and contains the clutch within the unit all running in an oil bath. It requires a pipe for water to drive it which passes down through the king pin, forward through the fish hold to either a centrifugal pump or Roturbine Pump in the engine room. The drive for this pump has to be substantial as it is in the neighborhood of 20 horsepower but elimination of all the shafting and gears of the other drive is very much to de desired. The waste water from the water turbine is discharged on deck and scuppered overboard. The water turbine drive enables the fisherman to regulate the speed of the roller to suit his need and stop it if the net is coming in too fast or gets wrapped around the roller.

All of the casters that support the net table from below and the steering gear quarter blocks should be connected with copper tubing so they can be greased with an Alemite gun at an inlet conveniently located.

To get the purse line a little further away from the guard of the boat and reduce the wear on the rope, the purse davit has been designed to reach further out. The difficulty with the purse blocks was overcome by having the Boston and Lockport Co. design a different block with a larger sheave and shorter distance from the top of the sheave to the inside of the bale. To use this block the eye on the purse davit has to be made horizontal instead of vertical as at present. The 10-inch snatch blocks now in use measure 10 inches from the inside of the hook to the top of the groove in the sheave. When the blocks are splayed forward and aft for pursing the net the distance from the top of the after sheave to the top of the forward sheave is 30 inches. The winch is 11 inches wide over the body with the gypsies on each side 13 inches over the near flanges and 32 inches between the far flanges so the purse lines do not lead properly to the winch with the present blocks.

The wear on the brail line of the net (called arse line and breast line by some fishermen) is caused by the outer gypsies on the winch being too small. The standard arse line gypsy on the Theo. H. Smith winch is 6 inches diameter and 6 inches long but they have been made as small as 3 inches diameter on order the result being that the small bend in the rope passing around the gypsy destroys the structure of the rope.

The rigging troubles are due to not having the same factor of safety throughout. Upon analysis some of the shrouds were loaded to their full capacity and others had ample margin. Some of the boats have the two shrouds shackled into a single fitting at the top that is only about strong enough for one.

The booms are amply strong as to dimensions but the mast in some cases is not in proportion to the boom. One very noticeable difficulty is that the gooseneck pin is often too close to the mast so when topped up the heel of the boom presses against the after side of the mast. When the fish brail is dumped into the hold there is an upward jerk of the boom that puts a strain on it due to being jammed at the bottom and which probably accounts for the booms breaking.

● Hull Trim and Form

The trim of the boats is a symptom of several troubles and when the other troubles are corrected the trim automatically corrects itself. At present when the boats go out light they vary from 12 inches to 33 inches down by the head and change trim about 60 inches in the opposite direction when loaded. By changing the model of the boats they will be on an even keel when they go out in the light condition and with the hold full of fish and none on deck they will be down by the stern about 22 inches. When the fish are stowed on deck the boat trims back on an even keel again. The boats as now loaded with the deck awash carry a fish cargo equal to about 73 per cent of the weight of the boat in the light condition and when the model is changed to correct the vagaries of trim the boat carries 113 per cent of its weight or 54 per cent more.

The increase in carrying capacity of the boat raises a question as to the loading and the proper size of catch. If two drags of the net are necessary to fill the boat, time becomes a factor as follows:

Going out to the fishing grounds	5 hours
Setting net and brailing	8 hours
Searching for new school of fish	2 hours
Setting net and brailing	8 hours
Return to packing plant	6 hours
Unloading	10 hours
Total	39 hours

Changing the model also improves the speed of the boats about one-half of a mile per hour with the same power and if the fishermen will be satisfied with a good load without letting the boat down so deep in the water much better speed could be made on the return trip.

● Stability

The same change in model also corrects the stability. When the boats go out they are too stiff and there is one condition of loading when they have too little stability. The reason more of the boats have not upset is that they are so heavily loaded with gear when they go out that dynamically a large weight multiplied by a small righting lever gives somewhat the same effect as a smaller weight and a large righting lever. It is the heavy loading with gear that makes the present boats such poor carriers. The center of gravity of the purse seiners is about 15 in. below the deck and they have too much metacentric height when light and too little in the loaded condition. The only way to get the correct model is to design the part of the boat below the light water line to carry the gear properly and the part above to carry the cargo. The congested condition existing under the engine room floor was corrected by raising the engine about 6 inches from where it is usually placed.

Some Recent Changes in Steamboat Inspection Rules

At the April 29 meeting of the Executive Committee of the Board of Supervising Inspectors the following changes and additions to existing rules were approved:

Rule I (Fifty-first Supplement to General Rules and Regulations), Section 15, was amended by the deletion of paragraphs M-15-1 to M-15-7, inclusive, and the substitution of the following:

Sec. 15—Steel Forgings

[In substantial agreement with A. S. T. M. Spec. A-105-33. Certified material—Class B]

M-15-1. Materials and purposes. — There shall be two grades, either of which may be used for forged mountings for boilers and other pressure vessels, pipe flanges, valves, fitting, etc., viz:

Grade A: Forgings to be attached by fusion welding. Maximum carbon content 0.35%.

Grade B: Forgings to be secured by other means than welding.

The forgings shall conform to the sizes and shapes ordered.

M-15-2. Process.—(a) The steel may be made by either or both the following processes: Open hearth or electric furnace.

(b) A sufficient discard shall be made from each ingot to secure freedom from injurious piping and undue segregation.

M-15-3. Heat Treatment. — (a) Grades A and B steels shall be heat treated. Heat treatment may consist of annealing or normalizing.

(b) The procedure for annealing shall consist in allowing the forgings, immediately after forging or rolling, to cool to a temperature below the critical range, under suitable conditions to prevent injuries by too rapid cooling. They shall be uniformly reheated to the proper temperature to refine the grain (a group thus reheated being known as an "annealing charge") and allowed to cool uniformly in the furnace.

(c) The procedure for normalizing shall consist in allowing the forgings, immediately after forging or rolling, to cool to a temperature below the critical range, under suitable conditions to prevent injuries by too rapid cooling. They shall then be uniformly reheated to the proper temperature to refine the grain (a group thus reheated being known as a "normalizing charge") and allowed to cool in still air.

(d) No flanges which have been quenched in any liquid medium shall be offered under these specifications.

(e) Forgings made from Grade A or Grade B materials which are to be attached to vessels which are stress relieved after fabrication do not require heat treatment in accordance with the above paragraphs.

M-15-4. Chemical properties and tests. —(a) The steel shall conform to the following requirements as to chemical composition:

		Grades A and B
Manganese	per cent	0. 40--0. 80
Phosphorous Max.	do	0. 05
Sulphur Max.	do	0. 05
Silicon, Max.	do	-------

M-15-5. Ladle analysis.—An analysis of each melt of steel shall be made by the manufacturer to determine the percentage of the elements specified in M-15-4.

M-15-6. Check analysis. — (a) An analysis may be made from one forging or rolled flange representing each melt. The chemical composition thus determined shall conform to the requirements specified in M-15-4, except that phosphorous and sulphur may not exceed 0.055 per cent.

(b) All drillings for analysis shall be taken at least ¼ inch below the surface, or turnings may be taken from test specimens.

M-15-7. Tensile properties and tests. —(a) Forged or rolled-steel forgings and flanges shall conform to the following minimum requirements as to tensile properties:

	Forgings for welding **Grade A**	**Grade B**
Tensile strength lbs. per sq. in.	60,000	70,000
Yield point lbs. per sq. in.	30,000	36,000
Elongation in 2 inches percent	25.0	22.0
Reduction of area percent	38.0	30.0

(b) The yield point shall be determined by the drop of the beam or the halt in the gage of the testing machine, at a speed of head of the testing machine not to exceed ⅛ inch per minute. The tensile strength shall be determined at a speed of head not to exceed 1½ inches per minute.

Rule III, page 3 of the Fifty-third Supplement to General Rules and Regulations, was amended by eliminating the paragraph on this page which relates to signal pistol and substituting the following paragraphs:

Signal pistol.—An approved signal pistol outfit consisting of an approved pistol with lanyard attached and 12 approved parachute signal cartridges, both contained in an approved portable water-tight metal case, the cartridge to contain a projectile which will give forth a brilliant red flame of not less than 20,000 candle power and capable of being projected vertically to a height of not less than 150 feet and of not less than 30 seconds burning duration.

The signal pistol outfit shall be constructed in accordance with the following specifications:

1. The pistol will be substantially constructed of good quality material properly protected against corrosion. The dimensions of the barrel and chamber of the pistol shall conform with the dimensions set forth in Figure 1 herewith.

2. The exterior case of the cartridge shall be made of a suitable metal and shall be reasonable proof against the entrance of moisture.

3. The signal projectile when discharged vertically upward shall attain an altitude of not less than 150 feet, and be so constructed that the parachute will be expelled at approximately the maximum altitude reached.

4. The pyrotechnic candle shall be suspended by a suitable parachute at the approximate altitude of expulsion and the average rate of descent during the period of burning shall not exceed 6 feet per second in reasonably still air.

5. The projectile case and delay element shall be so constructed as to prevent any possibility of the propelling charge blowing by and causing premature ejection of the projectile contents.

6. All approved signal cartridges shall be capable of being fitted into and fired from a pistol that is bored and chambered in conformity with the chamber drawing illustrated in Figure 1.

7. The pyrotechnic candle shall burn for not less than 30 seconds with a brilliant red flame of not less than 20,000 candle power as determined by a Sharp-Miller photometer or equivalent photometric device.

8. All pistols and cartridges must be marked with the name of the manufacturer and date of manufacture. All pistols and cartridges manufactured and approved before the effective date of this section may be continued in use until replaced.

The portable water-tight case shall be constructed of copper or other noncorrosive metal or steel which has been thoroughly galvanized, of not less than No. 19 BWG thickness, seams lock jointed and soldered. The cover shall fit on a tight, rubber gasket and be securely held in place by clamps or dogs. The case should be of a size that will conveniently contain the pistol and 12 cartridges.

The stowage of this equipment, except in the emergency and motor lifeboats, is discretionary with the master. (Effective July 1, 1936.)

On vessels certificated for Coastwise Service, signal pistol outfits shall be provided in the ratio of one signal pistol outfit for each five boats or fraction thereof.

Rule IV. Referring to the new regulations covering fire-detecting and sprinkler system as set forth on page 5 of the Fifty-third Supplement, the requirement relative to the effective date with reference to flammable construction was changed to read as follows:

(Effective July 1, 1936, or as soon thereafter as such installation may reasonably and practicably be made in the opinion of the Supervising Inspector of the District in which such vessel may be inspected.)

Section 17, Ocean and Coastwise; Great Lakes; and Rivers; and Section 16, Bays, Sounds, and Lakes other than the Great Lakes, Rule IV, were amended by the deletion of paragraph 12 under "Smoke-pipe Systems" and the substitution of the following paragraph:

12. Scope of installations—Systems of this type shall provide one detecting device to which all smoke pipe shall lead, which device shall be located in the wheelhouse or in a fire station in which a 24-hour watch is kept. This device shall, where installed on vessels of over 5,000 gross tons, be provided with an audible alarm at the detecting panel together with an auxiliary audible alarm located in the engine room. (Applicable to all new installations of the smoke pipe systems.)

Section 11, Ocean and Coastwise, and Section 12, Great Lakes, Rule VI, were deleted and the following substituted therefor:

A. Signals

1. Steamers using the bell signals between the pilot house and engine room shall have a tube, of proper size, so arranged as to return the sound of the bell signals to the pilot house, and shall also be provided with a speaking tube or other device for the purpose of conversation between pilot house and engine room.

2. Voice tubes or telephone equipment installed on new or existing vessels or fitted as replacements on existing vessels to provide communication between the pilot house and (1) the emergency steering station, (2) the steering engine room, and (3) the engine room, shall conform to the following requirements.

B. Voice Tubes

1. Where the length of voice tube required exceeds 125 feet, or if for other reasons efficient communication cannot be obtained by a voice tube installation, telephone equipment shall be substituted.

2. Where the length of the voice tube as installed is not over 75 feet, the tube used shall be at least 2 inches in diameter. Installations having a length of over 75 feet shall be at least 2½ inches in diameter.

3. All voice tubes and voice tube fittings shall be of noncorrodible metal, and flexible tubes or bends shall be used in place of fittings wherever possible. Joints in tubing shall be made with white lead and tubes shall be supported at least every 8 feet on straight leads and on bends as required.

4. Voice tubes shall be protected where liable to injury and shall not be run in bunkers, cargo spaces, or through machinery spaces unless unavoidable, and they shall be amply protected by metal or heavy sheathing. They shall be provided at the lower end of all risers and in pockets where water can collect with suitable plugs for draining. Flexible terminal tubes, where used, shall have an entire metal inner surface. Voice tubes should be fitted with elliptical belled mouthpieces with hinged covers, with a whistle indicator on the side of the mouthpiece. All voice tubes shall be provided with designating name plates. Telephone equipment may in all cases be installed in lieu of voice tubes.

C. Telephone Systems

1. All telephone transmitters and receivers shall be of sound powered type designed especially for marine use. The Bureau shall approve and list equipment which, if properly installed, will meet the requirements set forth herein. The type number and model shall be plainly stamped on the equipment.

2. A call signal shall be provided at each telephone station. This signal may be a bell or other sound device which provides a distinctive signal throughout the space where the telephone is installed. At installations which are protected by watertight boxes, all signals shall be of such character as to comply with the above when the box is closed. Ringers, if located outside the box, must be of watertight construction. Installations on new and existing vessels shall be provided with call signals which are actuated by the operation of a magneto generator at the calling station, except that sound powered replacements of battery operated telephone equipment on existing vessels may be provided with battery operated call signals. In all cases the calling circuit shall allow any one station to call any other station individually.

3. At each telephone installation a suitable hangar for the handset shall be provided. It shall be constructed in such a way as to hold the handset firmly in place and away from the bulkhead. The handset shall not be dislodged from the hangar by the motion of the ship or by a severe shock near the mounting.

4. Telephones installed at external locations exposed to the weather or in locations subject to severe moisture conditions shall be enclosed in a substantial watertight cast metal box. The cover shall be hinged at the bottom of the box and when closed shall be fastened by a simple substantial mechanism which, when operated, exerts sufficient pressure to make watertight closure. The gasket shall be fastened to and inserted in the edge of the box or cover. The magneto generator and switches shall be of watertight construction. The generator and all switches shall be installed inside the box.

5. At other locations where a watertight box is not required, the telephone equipment shall be of splash-proof construction and shall be so installed as to minimize possibility of damage by external means. In engine rooms a booth or other suitable auxiliary equipment shall be provided if necessary in order that a telephone conversation can be carried on while vessel is being navigated.

6. The system shall be installed independent from any other systems of communication or of wiring, but may be extended to cover any other locations which are necessary or desirable. Telephone cable shall be of a type suitable for marine use and shall be run as close to the fore and aft center line of the vessel as possible, and protected from external damage. On passenger vessels where telephone cable must, due to the vessel's construction, run closer than one fifth of the beam to the side, port and starboard cables shall be provided and connected in parallel. It shall be so installed as to minimize ingress of water and dampness.

7. The talking circuit shall be electrically independent of the calling circuit. A short or open circuit or a ground on either side of the calling circuit shall not affect the talking circuit in any way.

D. Telegraph

Nothing in the above shall be construed to prevent the use of the so-called telegraph now in use for conveying signals from the pilot house to the engine room, but in all cases where the telegraph is used the signal shall be repeated back.

E. Cable Traveler

On all vessels subject to inspection where the distance is more than 150 feet between deck houses, a wire cable shall be stretched between the deck houses at all times when the vessel is loaded and being navigated, this cable to be not less than 5 feet from the deck; and there shall be attached at all times to the cable a traveler with a line of sufficinet continuous length to insure its operation, in order that communication between both ends of the vessel may be facilitated at all times: Provided, That, in addition to the traveler with the endless whip, as many loose rings with lanyards attached may be placed on the cable as may be deemed necessary by the master in charge of the vessel. Failure to have such cable stretched and traveler attached at all times when the vessel is loaded and being navigated shall be sufficient cause for the suspension of the license of the master or officer in charge: Provided, That a fore and aft raised bridge shall be accepted in lieu of the wire cable and carrier.

New Grace Line Piers in Manhattan

A Grace liner discharging cargo and passengers at Los Angeles harbor.

The Grace Line, on July 6, executed with Dock Commissioner John McKenzie a lease for City Pier 57, North River. Mr. D. Stewart Iglehart, President of the Grace Line, announced that beginning August 15 all Grace Line ships will dock on the North River. For many years the Grace Line service to the West Coast of South America has docked at Pier 33, Brooklyn, which they now vacate. Ships of the Central American-California service have berthed at Pier 61 North River, where they will continue. The operating staff will move to Pier 57, but executive and other departments will remain at 10 Hanover Square. Plans are being prepared for the remodeling and reconditioning of the passengers' waiting rooms and, according to the specifications being drawn up, the Grace Line passengers and visitors awaiting arrival of passengers will be afforded every comfort and convenience.

Mr. Iglehart stated that he had written to Dock Commissioner McKenzie expressing appreciation of the broad and businesslike manner in which the transaction had been handled by the City authorities.

"The City Government", said Mr. Iglehart, "has most definitely indicated its desire to encourage trade and travel with Latin America, and the concentration of all of our terminal operations in the North River, and particularly the use of Pier 57, long established as a great center of travel by the French Line, will be most helpful to travelers and shippers. This summer's travel to Latin America is larger than ever before. Both by sea and air travelers are increasingly turning to the attractions and diversions of the other republics.

"As a result of the greater speed and frequency of sailings of our modern ships, travel between Europe and the countries of the West Coast of South and Central America is now moving largely through New York instead of direct to and from Europe. This, in itself, is an indication of the importance of the port of New York.

"We plan to make known in Latin America the attractions of the World's Fair of 1939. It should bring an enormous number of our Latin American friends here, and we propose to prepare suitably for them by providing on Pier 57 the best possible facilities with possibly a few innovations."

Since the Grace Line began with the operation of sailing ships around Cape Horn to the West Coast of South America, its ships have had various homes on the New York waterfront. The present concentration on the North River sees more than 90 sailings a year for ports of the West Coast of South America, the greatest frequency ever attained by any line, American or foreign, to that part of the world.

The flag ship of this fleet is the new Santa Lucia. The Santa Clara and Santa Barbara have recently been completed with larger swimming pools and the substitution of a "Club" for both sexes for the old smoke filled Smoke Room.

Two interesting pictures from the Sperry Gyroscope Company showing a pioneer installation of master and repeater gyro compasses for the steamer Princess Anne. The figure at the left is the late Elmer Sperry, inventor of this gyro compass.

New Balboa Service for Diesel Motorships

At a cost of $102,000, the Panama Canal will soon begin the construction of an additional diesel oil system of pipe lines which will improve the service to ships by supplying Piers 15, 16 and 18, at Balboa, the Pacific terminus, with this fuel. The work will be completed by about January 1.

At present a diesel vessel berthing at any one of these piers must be shifted to Pier 4, 6 or 7 if it requires fuel. The bulk of cargo handling is concentrated at Pier 18, which is covered and affords ample warehouse facilities, while only passengers, mail and baggage can be adequately taken care of at the smaller piers. This condition has resulted in considerable delay to cargo laden vessels and the added expense of hiring tugs for movements from dock to dock.

Under existing conditions, vessels at Balboa with 20 tons or more of cargo to handle over the pier have no choice but to shift to and from Pier 18 to take required diesel bunkers, inasmuch as it is not possible to load or unload conveniently more than 20 tons of cargo at the piers where diesel lines are now established.

The specifications call for a 10-inch supply pipe line to be run from the pumping station at La Boca to outlets at Piers 15 and 16, a distance of more than two miles, in view of the necessary loops in the line. An 8-inch line will make the circuit under Pier 18 and have a number of independent outlets spaced 100 feet apart. Extra heavy wrought iron piping will be used.

Despite the limited facilities at Balboa for the purpose, 700,000 barrels of diesel oil were taken on ships at that port during the last year, as compared to 500,000 at Cristobal, the Atlantic terminus, where there are nine berths with diesel oiling equipment.

The rapid development of the Diesel internal combustion engine has had a marked effect in stimulating the traffic of motorships through the Canal in the past 14 years. In 1921, for example, there were only 99 transits by motorships, a figure representing only 2.8 of the 2,736 commercial vessels using the Canal and 3.2 of the total annual tonnage. Of the 5,180 vessels making the transit in 1935, there were 1,753 motorships, or an increase up to 33.8 per cent of all the commercial ships passing through the Canal in that year.

Statistics show that between 1921 and 1935, the total sale of diesel oil to ships at the Canal has increased from approximately 70,000 to about 1,200,000 barrels annually.

Trade Literature

Micromax Thermocouple Pyrometers. Written in simple, non-technical language, well illustrated, is this new 52-page catalog N-33A just issued by Leeds & Northrup. It explains the potentiometer method of measurement, the operation of the rugged, yet simple, mechanisms through which this balance method is made available to industry.

The new Silver-Anniversary Micromax, announced in the 25th year since this company originated the recording potentiometer, is described in detail. This thoroughly modern machine keeps always visible ten inches of record, while a bold pointer enables the operator to read temperature at a glance. The instrument can be equipped also to operate signals and automatic controls, and is available for measuring not only temperature but CO_2, liquid level, valve position, speed, smoke density, chemical strength, pH, frequency, load or voltage.

Set forth for ready comparison is the complete line of Micromax instruments, which offers the pyrometer user appropriate models to indicate, to record, to signal, to control, or to perform these functions in any desired combination.

This new catalog contains a wealth of information which everyone who uses or specifies pyrometers will want.

A historic incident of the San Francisco waterfront. Tubbs Cordage Company in 1899 delivers the manila towing hawsers for towing the U. S. coast defense vessel Monterey from San Francisco to Manila.

Marine Insurance Review

1935 Accident Experience in the Marine Industry

	Frequency		Severity	
TYPE OF INJURY	1935 Rate	Per Cent Reduction since 1927	1935 Rate	Per Cent Reduction since 1927
Death and Perm. Total	.24	7%	1.44	7%
Perm. Partial	.47	32%	.17	57%
Temporary	9.52	77%	.28	54%
Total	10.23	75%	1.89	13%

Frequency and severity rates by types of industry.

The Marine industry reduced its accident frequency rate during 1935 by a creditable 22 per cent, although the accident severity rate increased 18 per cent during the same period, according to reports from the National Safety Council.

The 1935 reports have been assembled from 55 marine organizations whose employees worked 121,936,000 man-hours. The 1935 average frequency rate of 10.23 (the number of disabling injuries per million man-hours of exposure) compares favorably with the average frequency rate of 14.02 for all-industries. But the corresponding average severity rate of 1.89 (the number of days lost per thousand man-hours of exposure) is 20 per cent above the average rate of 1.58 for all-industries during the same period.

The marine industry ranks thirteenth in frequency and twenty-second in severity among 30 major industries whose records have been compared for the year 1935.

The frequency of marine disabling injuries has decreased 75 per cent since 1927, in comparison with a reduction of 55 per cent for all-industries. In severity, however, the improvement is only 13 per cent, as against an average improvement of 32 per cent in severity for all-industries.

The 1935 injury rates were lowest in large units of the marine industry, but small units had the best experience in comparison with 1934.

Of the various branches of the industry, ship-building and repair units had the best 1935 records. Units of the same two classes also made the best showing in comparison with 1934 by reducing frequency 31 per cent and severity 13 per cent.

The industry has easily exceeded the pace of other industrial groups reducing the frequency of injuries, but it is lagging in severity improvement. The reduction in frequency since 1927 is 20 per cent larger than the average reductions by all industries, but the decrease in severity is 19 per cent less.

All types of injuries have decreased in both frequency and severity since 1927. The largest improvement has been in the frequency and severity of temporary disabilities; the smallest reduction has been made in the frequency of fatalities.

Small units had much higher accident rates during 1935 than large organizations. The improvement over 1934 rates in small units, however, exceeded the reductions in large organizations.

SIZE GROUP	1935 Frequency Rate	1935 Severity Rate	1934-1935 Change in Frequency	1934-1935 Change in Severity
Large	8.86	1.50	–20%	+34%
Small	25.75	5.49	–27%	–42%

Frequency and severity rates by size of group.

Tankers and liners, on the whole, had the worst records for 1935, averaging 16.45 for frequency and 3.38 for severity. Rates for tankers and liners were also higher than during 1934.

The National Safety Council has listed the following marine organi-

	Frequency Changes		Severity Changes	
INDUSTRY	1934 to 1935	1927 to 1935	1934 to 1935	1927 to 1935
MARINE	–22%	–75%	+18%	–13%
All Industries	–10%	–55%	–11%	–32%
Chemical	–13%	–60%	–44%	–42%
Public Utilities	– 5%	–74%	– 1%	–57%
Steel	–18%	–57%	– 1%	–10%
Construction	–16%	–53%	– 8%	–70%
Machinery	+13%	-33%	– 4%	–27%

Table of frequency and severity changes for various industries.

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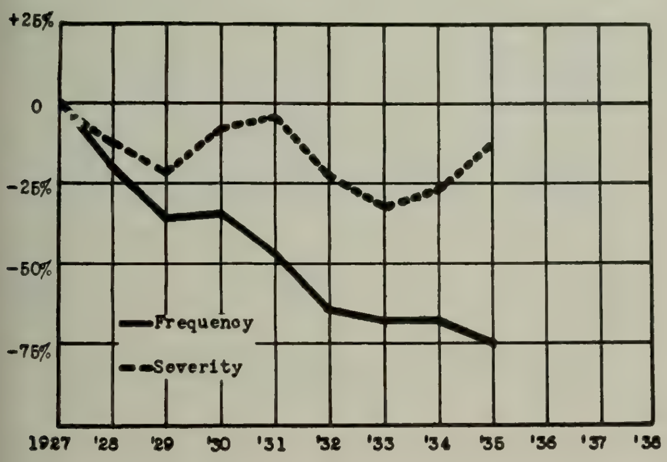
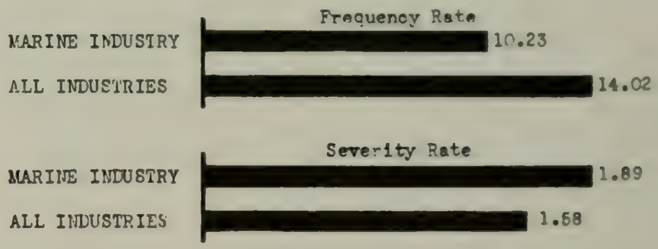


At left: Curves showing evolution of maritime frequency and severity rates from 1927 to 1935.

Below: Graph comparing maritime and other industries.



zations as deserving of special mention for outstanding safety achievements during 1935:

Harbor Equipment. Atlantic Coast Line Rairoad. The Norfolk, Virginia, units worked more hours without a disabling injury than any other organization with a perfect 1935 record—47,000.

Shipbuilding and Repair. U. S. Navy. The U. S. Navy Yard, Philadelphia, Pa., has the lowest 1935 frequency rate among large organizations—0.43. The U. S. Navy Yard, Boston, Mass., has the lowest 1935 severity rate among large units — 0.03. The U. S. Navy Yard, Norfolk, Va., has made the largest reduction in frequency since 1933 among large units—40 per cent; also the largest improvement in severity — 52 per cent.

Stevedoring. Atlantic Coast Line Railway. The Fort Tampa, Fla., unit has the best 1935 record — 68,000 man-hours without a disabling injury.

Tankers and Liners. Tidewater Oil Company. Lowest 1935 severity rate among large fleets—0.12.

International Notes and Technical Briefs

Liberties Clause: A new clause in effect April 1 this year was added to the Institute Cargo Clauses to take the place of the temporary "War Risks and Sanctions Clause." This new clause is officially designated "Liberties Clause: Termination of Contract of Affreightment," and reads as follows: "In the event of the exercise of any liberty granted to the shipowner or charterer under the contract of affreightment whereby such contract is terminated at a port of place other than the destination named therein, the goods are held covered in the terms of the policy at a premium to be arranged until sold or delivered at such port or place or notice be given to the underwriters to terminate the policy whichever first occurs; or, if the goods be forwarded to the destination named herein or to any other destination, until arrival at destination (subject to the provisions of clause 1 as to the period covered after discharge from the overseas vessel at final port); provided always that no liability shall attach to this policy for loss or damage occurring after the termination of such contract of affreightment and proximately caused by delay or inherent vice or nature of the subject matter insured."

It will be noted that this has nothing to do with ordinary deviation, which is covered by the "Deviation Clause." The contract of affreightment must terminate before this Liberties Clause applies. The contract being terminated, this clause

In the days of wooden ships and iron men, owners, officers and ocean going crafts themselves were, if possible, even more temperamental than they are today, but the American ship Florence, shown here, had a long and prosperous career under sail, with few claims on her underwriters.

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holds the goods insured under the general provisions of the policy and at an arranged premium until such time as the goods are delivered or the assured cancels the policy. However, even if the goods, in the general meaning of the policy, be assured against damage proximately caused by delay or inherent vice or nature of goods, such coverage ceases automatically on the termination of the affreightment contract.

Adjusters of Claims. At the weekly meeting on June 29, of Company and Lloyds Adjusters of Claims, Institute of London Underwriters, Mr. C. B. Maynard of Lloyds was unanimously elected chairman for the ensuing year, and Mr. G. T. Charles, adjuster of marine claims to the London Assurance, was unanimously elected vice-chairman for the same term.

I. U. M. I. Conference. This year's conference of the International Union of Marine Insurance will be held at Ostend in September. War risks and ship values will be two of the principal subjects up for discussion. Committees of the Union have been intensely studying these subjects during the past year, and it is expected that there will be two very meaty and interesting reports as bases for the respective discussions.

Shipbuilding and Insurance. In his introduction to a series of articles on this subject, Dr. E. Foerster, of Hamburg, makes the very interesting suggestion that while "classification societies and shipping supervision boards all over the world issue regulations according to which ships putting out to sea are to be properly built, not overloaded, well equipped, and engined so as to fulfill recognized technical standards. . . . These institutes have to compromise between the interests of shipowners and shipbuilders, and their provisions often fail, in part at least, to coincide with the full degree of safety that underwriters may well be entitled to demand. . . . If, however, insurers, whose interest in such questions is paramount, would cooperate more closely with those who are responsible for the construction and supervision of ships, the result would certainly be beneficial in preventing risks occurring through lack of deliberate study of the problem."

This series of articles is currently appearing in the "Marine Underwriter," published in English at Berlin by the International Union of Marine Insurance.

Cruiser Alton. While being towed from Honolulu to San Francisco by Learner & Rosenthal, shipbreakers, the U. S. cruiser Alton sank on July 9, 700 miles southwest of San Francisco. Insurance amounted to $35,000 on the scrap metal cargo, and $16,000 on the hull.

Cruiser Alton, formerly cruiser Chicago, was built by the famous old John Roach yard way back in 1889. She was a twin screw job, with horizontal triple expansion engines, 325 feet long, 48 feet 2½ inches beam, 19 feet maximum draft. If our memory serves, the Chicago was equipped originally with an experimental piece or ordnance known as a dynamite gun.

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Gold in Transit: During March, three bars of gold valued at £9,136, 13s. 6d. were stolen from the strong room at Croydon Airport, London. Marine underwriters had insured the Westminster Bank Ltd. against loss of the gold in transit between London and Paris. Imperial Airways carried liability insurance with aviation underwriters. On advice of marine underwriters, the Westminster Bank Ltd. brought action against the Imperial Airways to recover the full value of the gold. This case came before Justice Lewis of the Kings Bench Division for the trial of certain preliminary issues and on the 1st of July he gave judgment.

The issues at stake were:

(1) Did the consignment note satisfy the requirements of the Carriage of Goods by Air Act (1932)?

(2) If not, do the defendants have any defense to the plaintiff's claim?

(3) If the answer to (1) is yes, is the defendants' liability limited to 250 fr. per kilogram? and

(4) Was there a special declaration and a supplementary payment, and if so, what was the effect in law?

Justice Lewis decided that the defendants had not complied with the requirements of the Carriage of Goods by Air Act, as the only reference to that act was a somewhat ambiguous and general statement on the reverse side of the consignment note. The defendants therefore had no defense and were liable for the full value of the gold. The 3d and 4th questions therefore did not arise in this case, but Justice Lewis remarked on the 4th question that the ordinary declaration of value as made by the bank, and the payment of freight ad valorem, did not constitute "a special declaration and a supplementary payment" as contemplated by the Carriage of Goods by Air, and would not have prevented limited liability had the consignment note complied with the provisions of that act.

The effect of this judgment, unless it is modified by future proceedings, is that the marine underwriters will recover practically the full amount of their losses.

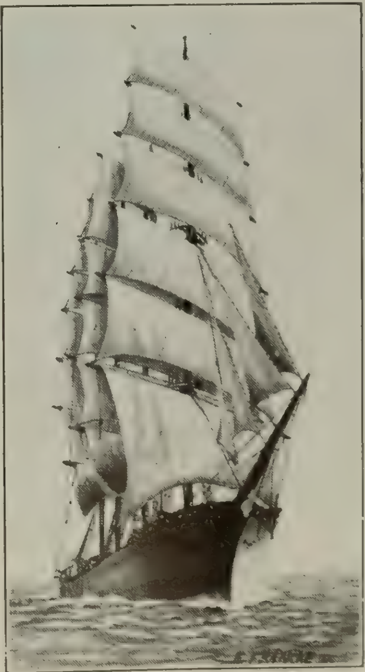
A Donkey in the House of Lords: The writer has often queried the origin of the words "Inchmaree Clause," so often appearing in marine insurance writings and policies. Here is the explanation as given in Pacific Marine Review of July, 1911.

The steamer Inchmaree case was decided by the British House of Lords in 1887, the facts being as follows: "S. S. Inchmaree was insured by a time policy in the ordinary form on the ship and machinery, including a donkey engine. In the ordinary course of navigation, the donkey engine was employed in pumping water into the main boiler. In consequence of a screw valve, which should have been open, being accidentally or negligently left closed, the water was forced into the air chamber of the donkey engine and split it open. It was held that the injury was not a peril insured against under the general words of the policy, not being 'ejusdem generis' with those specifically mentioned.

"The result of this decision was the formation and inclusion in policies of marine insurance of the clause known as the Inchmaree clause, reading as follows:

" 'This insurance also to cover subject to the special terms of this policy, loss of and/or damage to hull or machinery through the negligence of master, mariners, engineers, or pilots or through explosions (wheresoever or howsoever occurring), bursting of boilers, breakage of shafts, or through any latent defect in the machinery or hull, provided such loss or damage has not resulted from want of due diligence by the owners of the vessel, or any of them, or by the manager.' "

This explanation makes it appear that one damaged donkey from the cargo steamer Inchmaree limped through the devious paths of the Admiralty courts right up to the House of Lords to demand protection for shipowners against the damage caused by all the asses that might in the future be found among the officers and crews of the world's merchant ships. That donkey deserves a statue on the Thames embankment.



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On the Ways-

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Edited by F. DRYDEN MOORE

New Tanker Contract Signed

The largest shipbuilding order ever placed by a private corporation in this country was formally signed on July 16 between the Standard Oil Company of New Jersey and three United States yards, the Federal Shipbuilding and Dry Dock Company, the Bethlehem Shipbuilding Corporation, Ltd., and the Sun Shipbuilding and Dry Dock Company.

The contracts call for the construction of eight tankers, involving a total outlay of over $13,000,000. Construction of the vessels will mean a total of about 7,000,000 hours of labor, about 5,000,000 of which will be expended in the shipyards and the rest in work on outside purchases such as steel, boilers, dynamos, turbines, etc.

Four ships will be laid down in the yards of the Federal Shipbuilding and Dry Dock Company at Kearny, New Jersey. They will be 12,800 deadweight tons each, employing the Isherwood Arcform design of hull form and longitudinal hull framing. This yard has recently delivered to the Standard Oil Company of New Jersey two sister ships of this size and design, the S.S. R. P. RESOR and T. C. McCOBB.

Two tankers have been awarded to the Bethlehem Shipbuilding Corporation, and will be laid down at their Sparrows Point, Md., plant. These ships will be of what is known as Frear-Bethlehem designed hull with special fluted plating bulkheads, now employed for the first time, and will be 13,000 deadweight tons each.

Two tankers have been awarded to the Sun Shipbuilding and Dry Dock Company for construction at their yards at Chester, Pa. They will be 12,900 deadweight tons each, and will be constructed on the Isherwood Arcform of hull design and of Isherwood Bracketless hull construction.

All of these vessels will be single screw, 12 knots sea speed tankers, power to the propeller being supplied by high pressure steam turbines operating through double reduction gears. The boilers to be used will be of the water tube type, as manufactured by the Foster-Wheeler Corporation and the Babcock & Wilcox Company.

The new ships will be employed by the Standard Oil Company of New Jersey in its coastwise service. They will displace a somewhat larger tonnage of tankers, now in use but approaching obsolescence; this being possible due to the new tankers having a speed of about 2 knots more than the tankers now generally employed. They will be the most economical tankers ever built, owing to the adoption of features dictated by experience with all kinds of vessels, and there will be embodied in these new ships every practical device for the safety and comfort of the crew. In this connection, it is interesting to note that the design of the tankers calls for entirely fireproof vessels, including all furniture and fittings. The maximum berthing facilities will be two men to a room.

Contracts for the new tankers were executed in the offices of the Corporation Trust Company, Newark, at 10:30 a. m. on Thursday, July 16. Robert L. Hague, general manager of the marine department, signed for Standard Oil Company of New Jersey. Afterwards representatives of the three yards, the steel companies, engine builders and other suppliers, met with officials of the Standard Oil for completion of details. This meeting was followed by a luncheon given by Mr. Hague at the Ritz Towers.

The Standard Oil Company of New Jersey fleet is already by far the largest under private ownership anywhere in the world. It is comprised of 65 tankers with an aggregate deadweight tonnage of 862,970 flying the American flag, and 82 tankers with an aggregate tonnage of 1,142,000 under the various flags of foreign affiliated companies.

Texas Company Planning New Tankers

Two large tankers of 12,000 tons each are planned by the Texas Company at New York, at a cost totaling approximately $3,500,000, it was learned recently from bids asked by the company. Practically all of the Eastern yards submitted bids for the construction, and the Pacific Coast was represented by four yards invited to enter the bidding. The tankers will be operated in the company's world-wide service for transportation of oil, petroleum and fuels.

Pacific Coast Yard to Build Hopper Dredge

The Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., San Francisco, has been awarded a contract to build a steel twin screw diesel engine powered sea-going hopper dredge at a cost of $647,000. The dredge was ordered by the United States Engineer Office, San Francisco, and will have an overall length of 180 feet, a beam of 38 feet, and a hopper capacity of 300 to 500 cubic yards of sand.

Fleet of Fishing Boats to be Built by Astoria Yard

A fleet of 43 wooden sailing fishing boats will be constructed by the Lindstrom Boat Yards of Astoria, Oregon, ten of which are for the Nakat Packing Company and 33 for Libby, McNeill & Libby, Seattle. The boats will be 29 feet long, 8 feet 10 inches beam, 2 feet 10 inches draft, and of approximately 10 net tons.

Contract Awarded for West Vancouver Ferryboat

The West Vancouver Municipality has awarded to the West Vancouver Ship Repairers, Ltd., a contract for the construction of a 108-foot ferryboat. The boat will be 21 feet beam and will accommodate 325 passengers. Power will be furnished by a 230-horsepower diesel engine.

$1,000,000 Dry Dock for Peru

Contract for the construction of a dry dock terminal at Callao has been awarded by the Peruvian Government to the Frederick Snare Corporation, New York, at a cost of over $1,000,000. The new dry dock will be the only one between the Panama Canal and Talcahuano, Chile, on the West Coast of South America, a distance of almost 3,000 miles.

Navy Asks Bids for Nine Vessels

The Navy Department, Washington, D. C., will receive sealed proposals on August 19 for the construction of six destroyers and three submarines, to be built by private American yards, entailing half the building program for the fiscal year ending June 30, 1937. The remainder will be constructed by Navy yards, which have been asked to submit estimates. It is expected that the total construction cost for the eighteen vessels will very nearly approach the appropriation of $168,500,000 set aside by Congress and approved by President Roosevelt; this sum will, however, include their equipment.

New United States Liner Bids on September 15

Bids for the construction of a sister-ship to the Washington and Manhattan will be ready for the United States Lines by September 15, it was announced. Some time ago, the company asked for bids for the new ship, but probably owing to the Newport News Shipbuilding and Drydock Company being the only yard to furnish a specific figure, the line's application for a loan of 75 per cent of the cost of construction was refused by the Department of Commerce. Secretary Roper, of the U. S. Department of Commerce, asserted that he had received assurance from the U. S. Lines that one or more firm offers would be available on the date requested, and therefore action on the construction loan has been deferred until the latter part of September.

Contract for Five Barges Goes to Nashville Bridge Company

The Tennessee Valley Authority, Knoxville, Tenn., awarded contract to the Nashville Bridge Company, Nashville, Tenn, for construction of five steel barges 60x26x4 feet, at a cost of $20,500. Nashville Bridge Company was low bidder in the group of four yards submitting figures for the construction.

U. S. Destroyer Samson Launched

The launching of the U. S. Navy destroyer Samson recently took place at the Bath Iron Works Corporation plant at Bath, Maine. The Samson is being built at a cost of $3,429,000, not including her armaments, and is one of the two 1,500-ton destroyers let to the company in 1933 by the U. S. Navy Department. Miss Frances W. Andrews sponsored the Samson at the launching.

River Vessel Plans Held in Abeyance

Plans for an all-steel vessel to be operated by the Shaver Forwarding Company of Portland, Oregon, are being held in abeyance because of frequent channel interruptions at Bonneville Dam on the Columbia River, where navigation has been temporarily suspended. The vessel will be used by the company for service between Portland and upper river points.

Spedden Shipbuilding Company, Inc., Given Tender Contract

Contract has been awarded Spedden Shipbuilding Company, Inc., Baltimore, Md., by the Atlantic Gulf and Pacific Company, of New York, for the construction of an all-welded steel hull dredge tender. The tender will be 57 feet in length, 14 feet 6 inches beam, and 7 feet 6 inches deep. A 140-brake horsepower Fairbanks-Morse diesel engine will furnish the power.

Conversion Contract Awarded for Steamer Daniel Webster

For the conversion and reconstruction of the steamer Daniel Webster to a bulk carrier, the National Bulk Carriers, Ltd., of New York, subsidiary of the American Tankers Corporation of the same city, awarded contract to Welding Engineers, Inc., Philadelphia, and the General Ship and Engine Company, Boston. The Daniel Webster, with the John Adams, was recently purchased from the Government. She is intended to be used for the transportation of bulk cargoes, which will include oil, coal, grain and sulphur. The changes will entail removal of tween decks, moving of machinery to the after end of the vessel, installation of small tube Babcock and Wilcox boilers, rearrangement of deck erections, and so forth. After completion of the work, which is scheduled to require six months, the Daniel Webster will be renamed Bulkoil, when work on the John Adams will follow immediately.

Bethlehem to Build Two Destroyers for U. S. Navy

The Union Plant, San Francisco, of the Bethlehem Shipbuilding Corporation, Ltd., will build for the United States Navy two 1,500-ton destroyers, Hull 5355, McCall, (DD400) and Hull 5356, Maury, (DD401). Completion dates are September and December, 1937, respectively.

New Survey Boat for Portland

A 117-foot steel diesel electric survey boat, the Robert Gray, is under construction at the Lake Washington Shipyards, Houghton, Washington, for the U. S. Engineers, Portland, Oregon.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Completion date 9/-19/37, **Hull 5356—Maury (DD401)**; completion date 12/19/37; two 1500-ton destroyers for U. S. Navy.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. W. S. Rheem, S.S. K. R. Kingsbury, S.S. Chas. L. Wheeler, Jr., Dredge Texas, Dredge Dan C. Kingman, S.S. Talamanca, S.S. Los Angeles, U.S.A.T. U.S. Grant, M.B. Redline, S.S. Manini, S.S. Santa Elena, S.S. Antigua, Tug W. B. Storey, S.S. Charcas, M.B. Maltha, S.S. Chiriqui, Barge Martinez, S.S. Democracy, S.S. San Gabriel, S.S. Dorothy Alexander, M.S. Kern, M.S. Roseville, S.S. Maunganui, S.S. Cuzco, Tug F. A. Douty, Tug Tatoosh, S.S. Pres. Hayes.**

FELLOWS AND STEWART, INC.
Wilmington, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: 17 yachts from 24′ to 75′ on ways for repair and general service July 8, 1936.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Barge 1922** (Union Oil Co.) Gas **S. St. Mary,** American Dredging Co., **S.S. Barbara C, S.S. Lake Miraflores, S.S. Coalinga.**

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK, PAINT, MISCELLANEOUS: **M.S. Athelchief, M.S. Athellaird, S.S. Anniston City, S.S. Admiral Nulton, S.S. Bessemer City, S.S. President Harrison, U.S.A.T. Republic, S.S. Steel Exporter, S.S. Steel Inventor, Yacht Spanish Rake.**

LAKE WASHINGTON SHIPYARDS
Houghton, Washington

NEW CONSTRUCTION: 117′ steel diesel electric survey boat **Robert Gray** for U. S. Engineers, Portland, Oregon.

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Yacht Dolphin, Yacht Seaward, S.S. Golden Star, M.V. New Zealand, S.S. Trimountain, S.S. La Placentia, Tug D. N. Renton, Tug Vivo, Yacht Haida, Tug D. P. Fleming, Tug Listo, M.V. South Africa, M.V. Heina.**

THE MOORE DRYDOCK CO.
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Golden Tide, Redwood, Nevadan, S.S. Maunawili, Arizonan, S.S. Eagle, Manatawny, H. T. Harper, Covena, Kewanee, Marco Polo, Dredge Golden Gate, Melville Dollar, Hawk, Yerba Buena, Hawaiian, Polaris, Zaca, Hayward, M.S. Patterson, S.W. Frances, Water Barge No. 30, Sobre Los Olas, Beulah, Tug Hercules, Diana Dollar, Hobby II, Tejon, Oil Barge 1923, Brookings, Willboro, J. C. Fitzsimmons, Hindes, Tug Virgil G. Bogue, Point San Pedro, La Purisima, Dredge Sacramento, S. C. T. Dodd, Janidore.**

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK, PAINT, MISCELLANEOUS: 9 fishing boats docked, cleaned, painted, misc. hull and engine repairs. 36 ship repair jobs not requiring docking. 40 commercial jobs.

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); standard displacement 1500 tons; LBP, 334′; beam, 35′1/8″; loaded draft, 10′10″; geared turbine engines; express type boilers; keel laid August 15, 1934; launched, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); standard displacement 1500 tons; LBP 334′; beam, 35′1/8″; loaded draft, 10′ 10″; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; launched Dec. 31, 1935.

U.S.S. Patterson (Destroyer No. 392); standard displacement, 1500 tons; keel laid July 23, 1935; estimated completion date, February 1, 1937.

U.S.S. Jarvis (Destroyer No. 393); standard displacement, 1500 tons; keel laid August 21, 1935, estimated completion date, May 1, 1937.

Construction of **Destroyer No. 408, U.S.S. Wilson,** 1500 tons, keel not yet laid.

DRYDOCK, PAINT, MISCELLANEOUS: **Northampton, Maryland, California, Mississippi, New Mexico, Lexington, Ranger, Utah, Eagle No. 57, Swallow, Mahopac, Tatnuck, Challenge, Wando, Aroostook, Jason, Kearsarge (Crane Ship), Patoka, Pawtucket, Prometheus, Pyro.**

STEPHENS BROS. BOATYARD
Stockton, Calif.

NEW CONSTRUCTION: **One 48′ cruiser,** teakwood hull, equipped with Scripps 164-165 motors.

Three 36′ stock cruisers; one completed, one partially constructed, and one under construction.

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Andrea Luckenbach, S.S. Lewis Luckenbach, S.S. Lake Frances, S.S. Arthur Baldwin, S.S. Otsego, S.S. General W. C. Gorgas, M.S. Northland, S.S. Depere, S.S. Point Estero.**

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith,** Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934, launched April 22, 1936.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery August, 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 112.** Freighter for Puget Sound Freight Lines, Seattle; L.B.P. 154′; beam 38′; two i.h.p. Atlas engines; keel laid May 25, 1935; launched Jan. 14, 1936; delivery date not given.

Hull No. 114. One purse seine boat; 82′ L.B.P.; keel laid September 1, 1935.

Orders received for **4 purse seine fishing vessels.**

Atlantic, Lakes, Rivers

AMERICAN BRIDGE CO.
Pittsburgh, Pa.

NEW CONSTRUCTION: **30 barges;** 132′ x 35′ x 10′; weight 7500 tons, with cargo house; for Mississippi Valley Barge Lines, St. Louis, Mo.; delivered.

Five coal barges; 175′ x 26′ x 11′ for builders acceptance.

DRYDOCK, PAINT, MISCELLANEOUS: New sides and bilge knuckles on ten 175′ coal barges for Carnegie-Illinois Steel Co.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hull No. **159, Drayton (DD 366), torpedo boat destroyer.** U.S. Navy; keel laid, March 20, 1934; launched March 26, 1936; **estimated delivery Aug. 15, 1936.**

Hull No. 160, Lamson (DD 367), torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launched June 17, 1936; **estimated delivery October 15, 1936.**

Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis and DD396 Jonett;** Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively, **DD-396,** keel laid, Mar. 26, 1936. **DD394,** keel laid April 8, 1936.

Hulls Nos. 164, 165, and 166, trawlers, single screw, steel, diesel propelled, for delivery in September and October, 1936, to Boston, Mass., owners.

Hull No. 167, Ferryboat **Aquidneck.** Diesel electric ferry for U.S. Navy; estimated delivery, March, 1937.

Hull No. 168, Trawler, single screw, steel, diesel propelled, for delivery to Boston, Mass., owners, during December, 1936.

Hull No. 169, Trawler, single screw, diesel propelled, for delivery to Boston, Mass., owners in April, 1937.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA44, Vincennes,** 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD362, Moffett, keel laid, January 2, 1934; launched Dec. 11, 1935; **estimated delivery July, 1936.**

DD363, Balch, keel laid, May 16, 1934; **estimated delivery, August, 1936.**

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

BETHLEHEM SHIPBUILDING CORPORATION
Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers**—steam—425′x64′x34′ for Gulf Refining Co.; total tonnage 7070 each.

CHARLESTON SHIPBUILDING & DRYDOCK CO.
Charleston, S.C.

NEW CONSTRUCTION: **One 60-ft. all-welded lighter** for stock. Rebuilt 6 lighters (wooden) for Chesapeake Corp.

DRYDOCK, PAINT, MISCELLANEOUS: **S.S. Erviken, Tug Barrenfork, Tug Waban, Tug Hinton, Tug Lockwood, Tug Cecelia, Yacht Neelia, S.S. Saccarappa, Tug Congdon, Yacht Chereo, Relieflightship 109, S.S. Seven Sea Sound.**

COLLINGWOOD SHIPYARDS, LTD.
Collingwood, Ont.

S.S. Bayton, bulk freighter; owner—Colonial Steamship Co., Sarnia, Ont. Docked Apr. 27, 1936. Tail shaft drawn for examination, stern bearing relined, hull caulked, odd rivets tightened up, etc.

S.S. D. B. Hanna, bulk freighter; owner—Union Transit Co., Toronto. Docked April 30, 1936. Tail shaft drawn for examination, stern bearing relined. Sundry hull repairs.

S.S. James B. Foote, bulk freighter; Union Transit Co., Toronto. Docked April 30, 1936. Tail shaft drawn for examination, stern bearing relined. Sundry hull repairs.

Tug Zelda, steel tug; John Harrison & Sons Co. Ltd., Owen Sound, Ont. Docked May 15, 1936. Tail shaft drawn for examination. Sundry hull repairs.

Tug Pinola, wooden tug; John Harrison & Sons Co. Ltd., Owen Sound, Ont. Docked May 15, 1936. Tail shaft drawn for examination, hull caulked and sundry repairs.

DRYDOCK, PAINT, MISCELLANEOUS: **M.S. Blue Cross,** bulk freighter; owners, Blue Line Motorships, Ltd., Toronto; docked June 13, 1936. Bow damage repairs; two new propeller blades fitted; cargo space flooding valves installed.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **165-ft. Diesel-driven all steel mail boat** for U. S. Mail Service on Detroit River.

One 175′x34′x10′ tender for U.S. Lighthouse Dept. Two triple expansion steam engines; total horsepower 1000; keel laid July 1, 1936; estimated delivery, February 1, 1937.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997.** one diesel sternwheel towboat of 91 gross tons.

Hull No. 1243, one covered cargo barge 132′ x 35′ x 11′ for stock, of 313 gross tons.

Hull No. 1245 one welded towboat hull 145′x 32′ x 6′4″ for Pitsburgh Coal Co., of 300 gross tons.

Hulls Nos. 1262-1265 inclusive; four welded flush deck cargo box barges, 100′x26′x6′6″; 660 gross tons.

Hull No. 1268, 1 steel hull for towboat, 173′x34′6″x7′2″ for John W. Hubbard, Pittsburgh, Pa.; 770 gross tons.

Hull No. 1271, one welded steel fuel flat, size 125′ x 26′ x 8′; 260 gross tons.

Hulls Nos. 1274-1281 inclusive; 7 welded "W-2" coal barges, 175′ x 26′ x 10′8″; 3304 gross tons.

Hulls Nos. 1282-1291 inclusive; 10 welded"W-3" coal barges 175′ x 26′ x 10′8″; 4720 gross tons.

Hulls Nos. 1292-1295 inclusive; 4 welded flush deck cargo box barges 130′ x 30′ x 7′6″; 1000 gross tons.

Hull No. 1296, one welded cattle barge 196′ x 36′6″ x 8′ for Jersey City Stockyards; 1300 gross tons.

Hull No. 1297, one welded oil barge 110′ x 30′ x 11′ for Patterson Oil Terminals, Inc., Philadelphia, Pa.; 335 gross tons.

This makes a total of 31 hulls under contract, with a total gross tonnage of 12,740.

ELECTRIC BOAT CO.
Groton, Conn.

NEW CONSTRUCTION: Hull No. 23, **Perch,** S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; launched May 9, 1936.

Hull No. 24, **Pickerel, S.S. 177 keel** laid March 25, 1935; launched July 7, 1936.

Hull No. 25, **Permit,** S.S. 178, **keel** laid June 6, 1935; estimated launching, October 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser and DD369 Reid** for the U. S. Navy, estimated completion dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington;** keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937

Three destroyers, **DD 397, DD 398 and DD 399;** estimated completion January, April and July 1938.

Two 12,800 ton tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; estimated completion dates October 1936 and December 1936, respectively.

MANITOWOC SHIPBUILDING CO.

Manitowoc, Wis.

NEW CONSTRUCTION: **One** steel dredge hull for U.S. Engineers.

One steel dump scow and one steel dry dock section for Great Lakes Dredge and Dock Co., Chicago, Ill.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION: **H 359** aircraft carrier **CV5, Yorktown, for** U. S. Navy; keel laid May 21, 1934; launched April 4, 1936; original contract for delivery, October 3, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; original contract for delivery February 3, 1937.

H361, light cruiser, CL47, Boise, keel laid Apr. 1, 1935; original contract for delivery, August 22, 1937.

H362, light cruiser CL49, St. Louis; estimated keel laying Sept. 7, 1936; estimated delivery, Jan. 2, 1939.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION: Contract for four destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357),** launched April 18, 1936; **Hull No. 410, McDougal (DD358); Hull No. 411, Winslow (DD-359);** of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashvill (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935; estimated delivery dates are as follows: **DD357, Selfridge,** Feb., 1936; **DD358, McDougal,** Apr., 1936; **DD359, Winslow,** June, 1936; **CL42, Savannah, Aug., 1936; CL43, Nashville,** Dec. 1936; and **CL46 Phoenix,** August 1937.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION: **Hulls Nos. 1064 and 1066—two steel hull towboats** building for Donaldson Towing & Lightering Co., Phila., dimensions: 95' L.O.A. 88' L.B.P. x 24' x 14' 9"; one Unaflow vertical marine type engine, two cylinders 25" dia. x 20" stroke, 130 R.P.M. 600 I.H.P. One Scotch type boiler 13' 3" diam. x 11' 6" long, 3 furnaces, 185 lbs. W.P. Estimated delivery, October, 1936 and January 1, 1937, respectively.

SPEDDEN SHIPBUILDING CO.

Baltimore, Md.

NEW CONSTRUCTION: **57 ft. all welded steel hull dredge tender** for Atlantic Gulf & Pacific; L.O.A. 57' 7"; beam 14' 0"; depth 7' 0"; power 140 B. H. P. Fairbanks Morse Diesel Engine.

SUN SHIPBUILDING COMPANY

Chester, Pa.

NEW CONSTRUCTION: **Hulls No. 155-156.** Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485'6"x68'0"x37'0"; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; launching Sept. 19, 1936; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511'x65'9"x37'; 15,800 tons.

Hull No. 160, 1 oil tanker (steam) 520'x70'x40' for Atlantic Refining Co.; 18,500 tons.

TREADWELL CONSTRUCTION COMPANY

Midland and Erie, Pa.

NEW CONSTRUCTION: **10 Coal Barges** 175'x26'x11', for Pittsburgh Coal Co.

1 steel gold dredge (ladder type) **hull** 155'x70'x13' for South American firm.

1 barge 100' x 24' x 6' for Parsons & Rader.

UNITED DRYDOCKS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION: **DD364, Destroyer Mahan,** keel laid June 12, 1934; launched October 15, 1935; **completed August 15, 1936.**

DD365, Destroyer Cummings, L.B.P. 334'; beam 35'; mean draft 10'10"; keel laid June 26, 1934; launched Dec. 11, 1935; estimated delivery October 15, 1936.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched April 18, 1936; estimated delivery indefinite.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launching and delivery indefinite.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267' overall, 66' extreme breadth, 19'9" depth; keels laid April 4, April 27, and May 1, 1936, respectively; estimated launching, November 17, December 8, and December 29, 1936, respectively; estimated delivery, January 19, Feb. 9, and March 2, 1937, respectively.

UNITED STATES NAVY YARD

Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case,** L.B.P. 334'; beam 35'; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, September, 1936.

Destroyer DD371, Conyngham, L.B.P. 334'; beam 35'; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, November, 1936.

DD389 Mugford and DD390 Ralph Talbot, two light destroyers; keel laid, October 28, 1935; estimated delivery February, 1937 and May, 1937, respectively.

DD402 and DD403, two light destroyers for United States Navy; no details available at present time.

UNITED STATES NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION: One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; **estimated launching Aug. 1936;** estimated completion, Jan., 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD

New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B. P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, September, 1936; estimated delivery May, 1937.

CL 48, **Honolulu,** light cruiser; L.B. P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January, 1937; estimated delivery October, 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers. No date set.

PG. 50, **Erie,** gunboat; L.B.P., 308'; beam, 41"; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; launched January 29, 1936; **delivered August 1, 1936.**

CG 69 and CG 70, **Alexander Hamilton and John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308'; beam 41'; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

UNITED STATES NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia,** L.B.P. 600'0"; beam 61',7¾"; molded depth at side to main deck amidships 42'0¾"; draft corresponding to normal displacement 21',8½"; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

(Continued on Page Adv. 30)

Observations From The Crow's Nest

"NAMES AND NEWS" ★ BY BERNARD De ROCHIE

The H. T. Haviside Tows No. 4 to Morro

That's the Haviside Company's new tug in our illustration. Formerly the Craig, of Long Beach, the diesel-powered steel craft is one hundred feet long, with a 6-cylinder Winton of 400 horse.

The tug, renamed the H. T. Haviside, got her initial workout with her new owners this month by pulling big derrick Barge Number 4 southward some two hundred fifty miles to Morro Bay—from San Francisco, of course.

Your observer watched the tow move up the stream. We caught her with the trusty camera as she was passing Alcatraz—and later on as she was settling down in earnest for the big pull ahead.

Interviewing H. T. Haviside upon completion of the voyage, we found him enthusiastic over the workout for his new tug.

"Everything worked smoothly. It was a beautiful tow!" H. T. declared.

The Texas Company, installing a submarine line for a new loading terminal at Morro Bay, called for the services of big Number 4 and her equipment. An 8-inch Tubbs Cordage Company "Supercore" towing-line was used.

"All you could ask for in a rope," Mr. Haviside expressed it.

"The tug carried a 150-fathom coil. At times we had 140 fathoms out. It handled perfectly and gave us a real demonstration of flexibility, elasticity and brute strength."

Completing her job at Morro in another two weeks, Number 4 will return to her San Francisco berth around the end of July.

We rather like this camera shot, reproduced as our main illustration. Without resorting to retouching or camouflaging, we bring you the Tubbs tow-line plain as day right on the job!

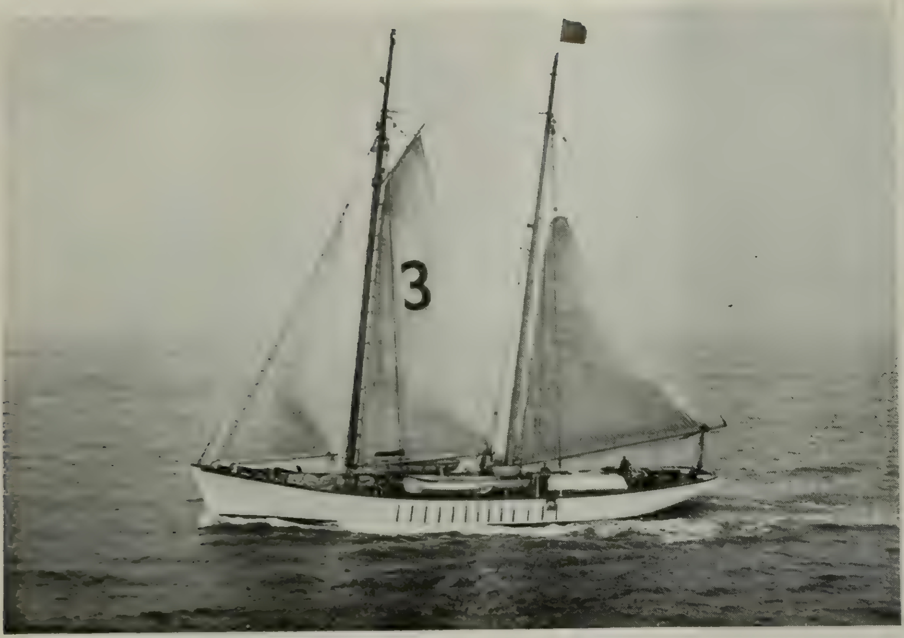
A little jaunt of 500 miles is all in the day's work for Number 4. She is manned by experts who know their "lifts"—and their tow-lines.

Arthur Butterworth Visitor

Meeting old Pacific Coast friends and recounting incidents of his former days at the old Union Iron Works and in the engine-rooms of Pacific merchant ships, Arthur Butterworth spent a combination vacation and business sojourn in San Francisco and Los Angeles during July.

The inventor of the Butterworth system for tank cleaning dropped into our (not so) sanctum sanctorum and swapped yarns with Pacific Marine Review editor Dickie, himself a "grad" of the good old Union Iron of the '90s.

Mr. Butterworth enjoys the friendship of many present-day maritime leaders who, like himself, came up "through the shaft alley" of Coast steamers.



The Alert Gracie S of the Bar Pilot Fleet

The vigilance of the San Francisco bar pilots is reflected in this action shot of the Gracie S.

We came across this grand little picture through the courtesy of Henry M. Plate, one of San Francisco's most popular bankers, who works out with his "minnie camera" as a hobby.

The photo was taken from the good ship Antigua, of the Great White Fleet, right outside the Gate, as the Antigua, inbound from Panama, had just taken on a bar pilot for the big berthing job up the bay.

The Gracie S is one of the well-loved old timers of the alert bar pilot fleet. She was built by Union Iron Works, San Francisco, in '93, and has a record of almost continuous service, with timbers as sound today as when they were built into her hull. She measures 91 tons gross and 52 tons net, and is 83 feet long by 24.7 feet beam and 10.2 feet depth.

The Adventuress and the California are her companions in her watch at the Gate, the last named being the largest of these three auxiliary schooners.

A twenty-four-hour watch is maintained at the bar. The record runs to 85 years. The pilots are twenty in number, all master mariners of long sea experience.

Our thanks to Mr. Plate for this action picture.

## ● Kearfott President Visits Us

A July visitor at Pacific Marine Review offices was Frederick E. Herberts, president of Kearfott Engineering Corporation, New York.

Mr. Herberts told us of the reception aboard the Queen Mary the day before he started Westward. The Society of Naval Architects and Marine Engineers was honored in conjunction with the Montclair Society of Engineers, of which group Mr. Herberts is chairman.

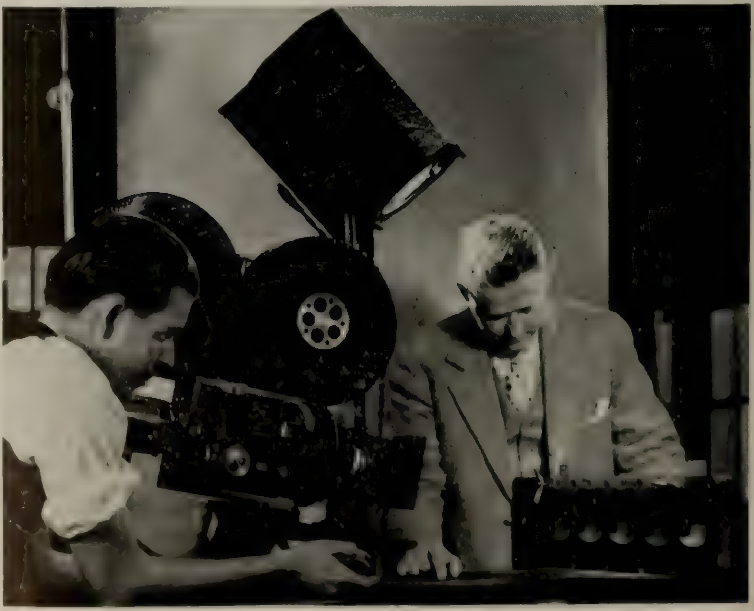
"She's a great craft!" he says. "Every week we can watch the Normandie and Queen Mary on their alternate weekly schedules as they steam down the river—an impressive sight from our Liberty Street office."

While we were still talking of "ships and sealing-wax," a telegram came in for Mr. Herberts, announcing the arrival of an eight-pound granddaughter at the home of his daughter. The baby has been named Jane.

The Kennedy Valve Manufacturing Company of Elmira, N. Y., announces the appointment of Leonard E. Shaffer as Pacific Coast Manager. Mr. Shaffer will be in charge of the Kennedy San Francisco Branch at 448-450 Tenth Street, San Francisco, Calif., where a warehouse is maintained for stocks of Kennedy valves, pipe fittings, and fire hydrants. He will also continue to maintain his Los Angeles office at 1340 East Sixth Street, Los Angeles, Calif., where he has been the Kennedy Southern California representative for many years.

Camera Records Formation of Carbon

The motion picture camera is here being used by Union Oil Company research engineers to prove a low carbon forming oil, such as Triton, will cause the removal of carbon in badly carbonized motors. Dr. R. I. Stirton is manning the camera, while Dr. Ulric B. Bray, assistant manager research, observes the condition of the motor.



Aboard the H. F. Alexander. Left to right are: Capt. F. M. Edwards, Capt. T. W. Lion, C. E. Finney, Lyn Fox, Byron Pickard, Ralph Myers and Paul Faulkner.

The Propeller Club of California Ship Safety Contest is On!

Officially under way on July 1, the Pacific Ship Safety Contest sponsored by the Propeller Club of California, and administered by joint committee of the club and the Accident Prevention Bureau of the steamship associations, will reward the records of entrants for the six months' period ending December 31.

One hundred thirty-nine vessels are already in the race.

Aboard these ships are displayed striking posters addressed to the ship personnel. A typical poster reads:

"To All Hands:

Subject: **Safety Contest**

This ship is entered in the 1936 Marine Safety Contest of the Pacific American Merchant Marine.

We have a chance to win one of the prizes offered by the Propeller Club of California if we can keep our injury rate lower than it was in 1935.

This ship will be flying a Safety Flag next year if every man aboard will always do his work in a safe manner."

The committee, headed by Byron C. Pickard, chief safety engineer of the Accident Prevention Bureau, includes:

Stanley E. Allen, Standard Oil of California and secretary-treasurer of the Propeller Club of California; Capt. F. M. Edwards, of Matson Navigation Company; Edward H. Harms, McCormick Steamship Company and chairman of the Board of Governors of the club; C. Lyn Fox, Waterfront Employers Association of San Francisco; C. E. Finney, of Sloss, Turner and Finney; Capt. T. W. Lion, of Swayne & Hoyt, Ltd.; Ralph W. Myers, of Hobbs, Wall & Company; H. M. Kelly, operating manager of Pacific Steamship Company; and Paul Faulkner, publicity committee of the club.

Official entries are:

Freighter Division	**Contest Executive**	**Ships Entered**
Pacific Atlantic S. S. Co.	R. S. Kimberk	13
States Steamship Company	R. S. Kimberk	8
Gulf Pacific Line & Gulf Pacific Mail Line, Swayne & Hoyt, Ltd. Agents	Capt. W. T. Lion	12
Pacific Steamship Lines	H. M. Kelly	5
Grace Line	F. L. Doelker	5
McCormick S.S. Co. (Intercoastal Fleet)	E. H. Harms	5
McCormick S. S. Co. (P. A. B. Fleet)	E. H. Harms	9
Matson Navigation Co.	Capt. F. M. Edwards	22
Oceanic & Oriental Navigation Co.	Capt. F. M. Edwards	6

Passenger Carrier Division	**Contest Executive**	**Ships entered**
Dollar Steamship Lines	Capt. L. H. Westdahl	14
States Steamship Co.	R. S. Kimberk	3
Pacific Steamship Lines	H. M. Kelly	3
Matson Navigation Co.	Capt. F. M. Edwards	2
Oceanic Steamship Co.	Capt. F. M. Edwards	2

Steam Schooner Division	**Contest Executive**	**Ships entered**
P. L. Transportation Co.	P. L. Transportation Company	1
Hobbs, Wall & Company	R. W. Myers	1
Los Angeles-San Francisco Navigation Company	R. W. Anderson	2
Coos Bay Lumber Co.	Coos Bay Lumber Co.	2
McCormick S. S. Co. (Fleet No. 1)	E. H. Harms	4
McCormick S. S. Co. (Fleet No. 2)	E. H. Harms	4
McCormick S. S. Co. (Fleet No. 3)	E. H. Harms	2
McCormick S. S. Co. (Fleet No. 4)	E. H. Harms	3
Hammond Shipping Co.	R. C. Robinson	6
E. K. Wood Lumber Co.	H. F. Vincent	2
A. B. Johnson Lumber Co.	A. B. Johnson, Jr.	2

Clay Hutchison, genial and popular passenger head of the Grace Line with headquarters in San Francisco, whose appointment here by Edward T. Ford, vice-president of W. R. Grace & Co., was well received by the transportation companies.

Mr. Hutchison is a veteran in point of service. He first entered the maritime field with the old Pacific Mail Steamship Company, then with the Panama Mail Steamship Company as manager in Los Angeles. He later went to Seattle as Northwest Passenger Agent until his promotion to his present position.

Mr. Hutchison is one of the best known executives in the transportation business. His refreshing personality and sincere attention to business has created hundreds of new friends during the short period he has been in his new position.

Grace Line Official Foresees Heavy Traffic

The largest volume of business in the history of California, for Napa, Marin and San Joaquin counties, is predicted by **Clay Hutchison,** general passenger agent of the Grace Line. "This business," says Hutchison, just returned from a visit to the important cities of these counties, "will begin in the last half of the present year and extend through the first half of 1937.

"Traffic to and from this section of the state will bring about a heavy passenger volume of rail, automobile, steamship and airplane travel, which in turn will benefit all of Northern California."

Hutchison, after recently taking over his new position, also made a survey of potential travel in the Pacific Northwest, Idaho, Montana and Utah, and is most enthusiastic over the travel outlook in those sections as well. As far north as British Columbia, and along the entire Pacific slope, he found people everywhere more interested in travel than in many years—a very hopeful indication for our transportation companies.

"Travel inquiries are coming in from all over the country for information about Northern California, owing in no small part to the construction of the San Francisco-Oakland Bay bridge and the Golden Gate bridge," concludes Hutchison, "and give indications of an all-time high tourist invasion for this season, and possibly even more so for the coming year."

From Los Angeles comes the announcement that General Steamship Corporation has made a number of advancements in the office in that city. **H. H. Birkholm,** vice president and district manager in Southern California, gives us the following information: **T. B. Matthews,** long on the staff in San Francisco and Los Angeles, has been given charge of the Oriental service department, handling the Silver-Java Pacific Line, the United Ocean Transport Company, and the Prince-Silver Line trades, succeeding **George R. Bower,** who has resigned to go with another agency as manager. **K. H. Pendleton** has taken over Matthews' former duties, and **W. B. Bryant** is handling outbound and transshipment traffic affairs, which were formerly discharged by Pendleton. **F. Goshert** took over Bryant's duties as disposition clerk for inbound services, and was in turn succeeded by **Grant Phillips.**

Captain Birkholm added that staff promotions such as the above are the policy of his company, which fills all vacancies in this manner and so gives its employees a good assurance of advancement.

The speedy Yale went out of service on July 6, **J. E. Ryan,** general passenger manager of the Matson Line, informs us. She will be laid up, owing to constantly advancing operating costs, which have made the service too expensive to maintain.

The Yale and Harvard had for many years been one of the best-known fleets on the coast, where they operated on a fast schedule between San Francisco and southern ports until the disaster of the Harvard left the Yale to carry on alone. Those who have watched her gliding through the Gate will miss the slim beauty of this white express liner and her accepted ability to outrun anything on her course.

No announcement has been made as to resumption of service, but it is to be hoped that the way will soon open for her to return to the old run.

H. E. Pippin, formerly general passenger agent in the Los Angeles office of Matson Navigation Co., recently was appointed assistant general passenger manager in the San Francisco office of the company.
—Pan-Pacific Press Bureau Photo

Matson Line's new assistant general passenger manager in San Francisco is **H. E. Pippin,** general passenger agent in Los Angeles during the past two years. He will be virtually executive assistant to **John E. Ryan,** general passenger manager for Matson and Oceanic, the position being necessitated by the constantly increasing transpacific traffic. Pippin has been with the Matson Line since 1926, entering as general agent in New York and later being sent to Sydney in charge of development of the Australian traffic.

A. A. Archibald, long a member of the Line's staff, has taken over the duties formerly belonging to Pippin, and so leaves his position of city ticket agent at Los Angeles.

George R. Bower has been appointed manager of Dodwell & Company, Ltd., at Los Angeles, and has already taken over his new duties for the company, **Keith J. Middleton,** director, announced. Bower resigned from his position as assistant traffic manager of the General Steamship Corporation to accept the post with Dodwell, where he had charge of the Oriental services. He has had sixteen years' experience in the steamship business, having been with Luckenbach and McCormick in San Francisco. In 1927, Bower went to Los Angeles as cashier for General Steamship Corporation, later being placed in charge of intercoastal and Australian solicitation, and finally in the post he has just vacated. During his stay in Los Angeles, he has been very active in club affairs, serving on the board for the Rail and Water Club and later as president and chairman of the board.

The Los Angeles office of Dodwell had, prior to the appointment of Bower, been under the management of **R. A. Tinling,** assistant coast manager, who may shortly return to his northern headquarters.

A new weekly service direct from Columbia River to Los Angeles Harbor was inaugurated by McCormick Steamship Company when the freighter Munami arrived at Wilmington on June 29, after a voyage of four and a half days from Portland. According to **J. L. Hook, Jr.,** district manager of the Los Angeles office, she carried a capacity load. The Munami will be followed by six other McCormick vessels in the new service.

Captain C. A. Berndtson is back in command of the Lurline again, after having been shoreside for several months on special duty for Matson Line. He has been succeeded on shore by **Captain "Andy" Thompson,** whose ship he commands.

We are glad to learn of the improvement of **James Tyson,** recently retired head of the Charles Nelson Company interests. Returning from a trip to Los Angeles, Tyson suffered a stroke and was taken to St. Francis Hospital for treatment. He and Mrs. Tyson recently made a trip round the world on one of the Dollar liners.

More good news from the Grace Line comes now from **W. B. Wheeler,** passenger traffic manager at New York, who says that intercoastal and transcontinental traffic is continuing its sensational advance. Six times as many passengers made the rail-water circle tour, started by Grace Line in 1931, last year, as did during the year of its inauguration.

▼

This Year It's Boston!

TENTH ANNUAL CONVENTION

●

Merchant Marine Conference

●

The Propeller Club of the United States

●

Boston, Mass.,
Sept. 28, 29, 30
1936

▼

Arthur Tode Coast Visitor

In the wake of his voyages to Pacific northwest ports of call, arrives photographic proof of Arthur M. Tode's cordial reception by district Propeller Club officers.

The honorary president of the Propeller Club of the United States visited Portland, Seattle, and Tacoma, after leaving California maritime districts. In Portland, he was greeted by Propeller Club president K. C. Conyers (McCormick Steamship Company,) and the club's vice president, Willis Clark (States Steamship Company).

In Tacoma, the welcoming "delegation" included the men pictured herewith. In the front row, left to right, are:

E. J. Clement, Luckenbach Steamship Co., treasurer; G. H. Dorfner, McCormick Steamship Co., president; G. G. Boyd, Matson Navigation Co., vice president; and Harold B. Veith, American Mail Line, secretary, all of the port of Tacoma.

Rear row, left to right, are:

Capt. F. E. Lovejoy, Puget Sound Freight Lines, president, port of Seattle; Arthur M. Tode, honorary president, Propeller Club of the United States; Edward Cunningham, Pacific Marine Supply Co., national vice president; and Alex D. Stewart, Railway & Marine News, secretary, port of Seattle.

Carl Allen, for a number of years assistant freight traffic manager for Hammond Shipping Company in San Francisco, has accepted a position with the Interstate Commerce Commission in Washington. He will be succeeded by **B. A. Webster,** ex-rate clerk for Nelson Steamship Company.

The Duffys in Los Angeles County have another member.

It's James Buckley Duffy the third, 8 pounds at the time of "launching," according to advices coming to the local offices of the Grace Line.

The father is district passenger agent for the company in Los Angeles. The mother is the former Estelle Del Valle, whose grandparents owned one of the largest ranches in Southern California.

James Buckley Duffy, the first, is the head of the Santa Fe Railway's passenger activities in the Western area.

Medicos, after a survey of the "craft" shortly after launching, pronounced James Buckley Duffy the third as having trim lines and being sturdily built throughout, with an unusually well-installed "bellows" system.

An uncle of the heir-apparent is Charlie Duffy, city passenger agent in San Francisco for the Santa Fe.

New Propeller Club is Formed at Portland

K. C. Conyers, district manager of the McCormick Steamship Company, was named president of the newly organized Propeller Club at Portland.

The vice president is Willis Clark, of States Steamship Company. Phil Thurmond, manager of the foreign trade department of the local Chamber of Comerce, was elected secretary.

Arthur M. Tode, honorary president of the national body, Propeller Club of the United States, in accepting the new Portland unit, stated:

"Through the Propeller Club we hope to be able to plan for the American merchant marine 50 years in advance, not from congress to congress or from administration to administration. Our shipping should be directed through a system similar to that operated by the British Board of Trade."

It is with regret that we record the passing of John Gilmore Platt, president and general manager of Hunt-Spiller Manufacturing Corporation. The untimely death of this Boston manufacturer was a result of a boat accident at Harwich, on Cape Cod, on Sunday, July 26.

John G. Platt.

Mr. Platt was best known to the marine field by reason of his long association with the Hunt-Spiller firm which he joined in 1907. His progress with the firm was made through positions as mechanical representative, sales manager, vice president and since 1928 he has served as president and general manager.

Quips That Pass in the Night!

A very nice old lady had a few words to say to her granddaughter.

"My dear," said the old lady, "I wish you would do something for me. There are two words I wish you would promise me never to use. One is swell and the other is lousy. Would you promise me that?"

"Why, sure, Granny," said the girl. "What are the words?"

"Then maybe, lass, ye'll help me get half-a-dozen doon out o' the attic."

GREATER ATTRACTION

Mother—Don't you want to be the girl that people look up to?

Edna—No, I wanna be the kind of girl that people look around at.

A blotter is something you look for while the ink dries.

Country Constable: "Pardon, miss, but swimming is not allowed in this lake."

City Flapper: "Why didn't you tell me before I undressed?"

Country Constable: "Well, there ain't no law against undressin'."

He: This is a quiet spot. I'd like to pause here and park.

She: You mean you'd like to park here and paw, but you're not going to.

Boarding-House Waitress (at resort): If you please, miss, the manageress says guests are not allowed to 'ave tea in their bathing costumes.

Modern Miss: She does, does she? Well, you go back and tell her I absolutely refuse to take it off.

Habit—The golfer had lost his ball, and not unnaturally, was inclined to be annoyed with his caddie.

"Why the deuce didn't you watch where it went?" he asked angrily.

"Well, sir," said the boy, "it don't usually go anywhere, and so it took me unprepared like."

SCOTCH MOVIES

He: "Are you fond of moving pictures, Jennie?"

She (hopefully): "Aye, Sandy."

A Scotchman was engaged in an argument with a conductor as to whether the fare was 5 or 10 cents. Finally the disgusted conductor picked up the Scotchman's suit case and tossed it off the train, just as they passed over a bridge. It landed with a splash.

"Mon," screamed Sandy, "isn't it enough to try and overcharge me, but now you try to drown my little boy."

THOSE RASCALS

She—"The world is full of rascals; this morning the milkman gave me a counterfeit half-dollar."

He—"Where is it, my dear?"

She—"Oh, I've already got rid of it—luckily the butcher took it."

A NEW ONE?

"Kid" Kalk, forestry truck driver, was wheeling his vehicle through one of the little villages up around Azusa when he was stopped by the town constable.

"Where do ya think yere goin," the constable inquired. "Do you know that you were going over 40 miles an hour?"

"Forty miles an hour, oh my no," said the "Kid." "Why, I have only been driving 45 minutes."

"Wal, . . . that's a new one on me," said the constable scratching his head with his pencil and putting away his book, "Go ahead," he added.

WATCH OUT

Some of our friends were out golfing last week. They made a rather long stay at the 19th hole before beginning their game. At the 8th green one player looked at his partner, and said, "I want you to understand, I resent your interference with my game—tilt this green over any more and I'll chuck the match."

HEALTHFUL

Gunner—"You shouldn't smoke in the powder magazines."

Boot—"It's O. K. I don't inhale them."

ROUGH ESTIMATE

Bosns Mate—"How many of those birds are working down there?"

Coxswain — "Oh, about half of them, I'd say."

SEA OF MATRIMONY

"Good morning, parson. Haven't seen you lately."

"No captain, I've been busy. Only this morning I married three couples in fifteen minutes."

"Smart going, parson. That's twelve knots an hour."

TRUE?

To show how careful a printer has to be with punctuation, read these two lines:

Woman: without her, man would be a savage.

Woman without her man would be a savage.

A story is told of a young man who went walking in the country. He suddenly came upon a nice horse grazing in the field. He was perhaps the prettiest horse he had laid eyes on, so he walked up to the farmer nearby and said:

"Do you want to sell that horse?"

"Sure, I want to sell the horse," the farmer replied.

"Can he run?"

"Can he run? Look!" Thereupon he slapped the part of the horse sometimes used for that purpose, and off trotted the horse full speed, running just as prettily as could be.

The young man thought he had never seen a prettier horse. Suddenly the horse ran full speed into a tree.

"Is he blind?" the young fellow hurriedly blurted.

The farmer thought even quicker.

"Hell, no," he drawled. "He just doesn't give a damn."

. . . . *An Original*
Pacific Marine Review Cross-Word Puzzle

1	2	3	4	5	■	6	7	8	■	9	10	11	12	13
14					15				■	16				
17				■	18				■	19				
20			■	21				■	22				■	■
23		■	24				■	25				■	26	27
■	■	28				■	29					30		
31	32				■	33					■	34		
35				■	36					■	37			
38			■	39					■	40				
41			42					■	43				■	■
44		■	45				■	46				■	47	48
■	■	49				■	50				■	51		

HORIZONTAL

1. Boss of the engine-room.
6. Compass point.
9. Windjammers used to round them.
14. A lively Limey stepper.
16. Animated.
17. Beverages.
18. Observed.
19. A fold.
20. Port light—port wine.
21. What ye old time barber did to his patrons.
22. Is this a mediocre definition? The answer in two words: — —
23. Think of a president!
24. Shows the way the wind blows.
25. Knot.
26. Catholic "lodge". (Why bring in religion?)
28. Convulsions.
29. He can be mechanical, civil and even sanitary, and you'll find him aboard every steamer.
31. What a sailorman does when he isn't busy hitching his trousers.
33. Killed.
34. River of the non-envious miller.
35. To let out your yacht.
36. A nautical back-porch.
37. This kind of hands is Lucifer's lab.
38. Aren't we all? (Sing.)
39. To beset.
40. Short—as in 11 Vertical.
41. Deck opening where persons and stuff can descend.
43. "Give's" partner.
44. Swiss Navy.
45. If you berl the erster you'll sperl this!
46. Woodpile depositors.
47. Brown derby nickname.
49. Uncle Moe's shop.
50. XZIT is the nemesis of this. (Another free ad, Professor.)
51. A number.

VERTICAL

1. The skipper's guide.
2. A fellow who—the more he takes out, the bigger it is.
3. Became enraged . . . got sore . . .
4. Printer's measures.
5. Will our harbor become one of these? (Init.)
6. Told in knots.
7. The little black thing in a watermelon. No, we don't mean "pickaninny."
8. Sea eagle.
9. The "old-man" of the sea.
10. To place in a row. (We pushed in an extra letter, eh?)
11. Keystone comedy missiles.
12. She went to Heaven.
13. A ship should never get — in her ways.
15. These show up in the South Seas!
21. Wagers.
22. "—, —, Number 9!" When you and I were young.
24. Ceremony.
25. A net.
26. From these great ships are built.
27. Politicians must do this before they run.
28. This is always first.
29. Gray wrote one in a graveyard.
30. Boy's nickname.
31. Rulers in Persia.
32. Italian countryman. "Comma Stai!"
33. To rob.
36. British trout (var.). Ye Ed found it in the Dictionary.
37. Annoys.
39. The passengers put this on at the ship's concert.
40. An abbreviated skipper.
42. Certified Public Accountant.
43. Ditto.
46. A little firm.
47. English article.
48. French article.

821-22-23 BALFOUR
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C. V. LANE
MARINE AND INDUSTRIAL EQUIPMENT

SAN FRANCISCO,
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METAL WORKERS' CRAYONS
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WELIN QUADRANT AND SHEATH SCREW DAVITS

MACLACHLAN GRAVITY DAVITS
METALLIC LIFEBOATS AND LIFERAFTS
HOSE AND PACKING
SHORT ALARM SERVICE TANK
SHORT OIL SEPARATOR
ECLIPSE STEAM TRAPS
WILLIAM W. NUGENT & CO.,
OIL FILTERS
TELESCOPE TUBE CLEANER
U. S. METALLIC PACKING
CONSOL RUST REMOVER
CONSOL RED AND BLACK
HASKELITE—PHEMALOID
PLYMETL ORNAMETL PANELS

PAIRMAN PYROMETERS
FORD'S PATENT TOWING CHUCKS
B. F. GOODRICH CUTLESS RUBBER BEARINGS
"TODD SYSTEM" & "WHITE SYSTEM" OF BURNING FUEL OIL MECHANICALLY
NECKAR WATER SOFTENERS
TODD DRYDOCKS, INC., DRYDOCKING AND REPAIRS

Inter-Coastal Paint Corporation

BALTIMORE, MD.

Originators and sole manufacturers of CONSOL both plain and in colors. A conditioning solution for metal surfaces that have become corroded. Not only a scale remover but a preservative as well. Gives excellent results when applied to boottop belt, hull, holds, bilges, tank tops, chain lockers, ventilator trunks, decks and so forth. Is non-inflammable and contains no acids or chemicals that are injurious to men or metal.

Todd Oil Burning Equipment

for over a quarter of a century, by its reliability of performance, efficiency and economy in operation, has consistently met the demands of power and heating plant engineers.

The marine, institutional, industrial and dwelling structure installations are delivering the usual Todd performance of effecting substantial savings in fuel cost, maintenance and operating expenses. Todd Oil Burning Equipment is manufactured by Todd Combustion Equipment, Inc., a division of the Todd Shipyards Corporation.

HYDE

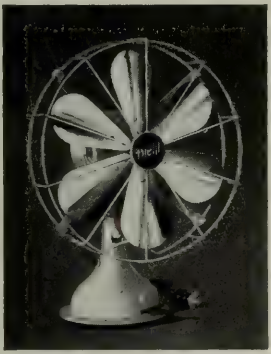
Steering Gears, Windlasses, Capstans, Bronze Propellers —as installed on America's finest ships.

HYDE WINDLASS COMPANY,
Bath, Maine.

The U. S. Metallic Packing Co.

PHILADELPHIA, PA.

has for the past 50 years specialized in the manufacture of strictly all metallic packings designed individually to suit operating conditions of steam, air, liquids, etc. Only the finest of materials and workmanship enter their construction to eliminate friction and rod wear.



Marine Motors, Generators and Ventilating Equipment

DIEHL MANUFACTURING COMPANY

Electrical Division of
THE SINGER MANUFACTURING CO.
Elizabethport, New Jersey

San Francisco Representatives:
MARINE ELECTRIC CO.
Desk and Wall Fans
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PLYMETL *Fireproof* PANELS

Plymetl bulkheads, as installed on the "R. P. Resor" and "T. C. McCobb," meet the latest requirements of the N.F.P.A. for fire resistance. The qualities listed below are available ONLY in Plymetl:

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Pacific Coast Representative:
C. V. LANE, 351 California St., San Francisco

HASKELITE MANUFACTURING CORPORATION . . 208 W. Washington St., Chicago, Ill.

● Matson Personal

Another change in the San Francisco office of Matson Line took place when **Howard Pilot**, who has been in the claims department of the Los Angeles Steamship Company in Los Angeles for the past ten years, was transferred here as assistant claims agent. **R. F. McDonald**, formerly with Matson in the Honolulu office and later in San Francisco, will take over Pilot's old berth, and himself be succeeded by **R. D. Hudson**, who was given Pilot's new post here a year ago.

● Xzit Sales Up

W. H. Rudy, of Xzit Pacific Company, working out of Los Angeles, was a July 8 visitor at our office.

The Xzit sales representative reported a very active week of sales to San Francisco steamship companies, and stated that this fire scale and soot eradicator is being accepted throughout the Coast districts with great success.

Mr. Rudy works through the organization of George E. Swett & Company, engineers, San Francisco distributors of Xzit.

John D. Reilly, president, and **Sanford S. Cox**, treasurer, of Todd Shipyards Corporation, were reelected directors for a term of four years. The stockholders present expressed their high commendation of the officers of the corporation for the fine showing made during the past year.

A leave of absence has been granted **M. J. Wright**, Pacific Coast manager of Luckenbach Steamship Company, owing to ill health. Getting away from business for a while, it is believed, will prove the necessary treatment, and we hope that he is soon able to get back on the job.

Building in American Yards

(Continued from Page 230)

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61' 9 ¾", depth molded at side to main deck amidships 42'0 3/8", draft corresponding to normal displacement 21'10"; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404**, 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS 179 Plunger**, keel laid July 17, 1935; launched July 8, 1936; estimated delivery Feb., 1937; **SS 180 Pollack**, estimated delivery May, 1937; L.B.P. 289' 0"; beam 24' 11-1/16"; loaded draft 13'9"; diesel electric engines.

Two 1400-ton submarines, SS185 Snapper and SS186 Stingray, order received from Navy Department; September, 1935.

A Century and a Quarter

H. S. G. I.
Reg. U. S. Trade Mark

STEAM RECIPROCATING
Cylinder Liners
Piston Packing Rings (Sectional or Snap)
Pistons and Bull Rings
Followers
Valve Bushings
Sectional Valve Rings
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DIESEL
Cylinder Liners
Pistons
Piston Rings
Cylinder Heads
Valve Seats
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Behind the trade mark "H.S.G.I." stands a record of over 125 years of an industry specializing in the manufacture of a superior, close grained, material made especially to resist wear at high temperatures.

Modern marine engine performance demands careful selection of the proper material for the vital cylinder parts.

Comparison of performance records shows greater efficiency with reduced maintenance costs when H.S.G.I. is used in the vital cylinder parts—liners, pistons, piston rings in both steam reciprocating and Diesel engines.

For maximum mechanical efficiency apply Hunt-Spiller Air Furnace Gun Iron to these parts on your next renewal, in the auxiliary as well as the main engines.

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Berkeley, Calif. San Francisco

HUNT-SPILLER Air Furnace GUN IRON

PACIFIC MARINE REVIEW

EPTEMBER
935

Official Organ

acific American
eamship Association

ipowners Association
the Pacific Coast

Tubbs Rope at Sea . . .

Tubbs "Supercore" aboard the tug H. T
Haviside. Mr. Haviside standing at right

. . *says Mr. H. T. Haviside*

"All you could ask for in a Rope

It handled perfectly and gave us a real demonstration of flexibility, elasticity and brute strength"

When the Haviside Company had the job of pulling big derrick Barge No. 4 southward some two hundred and fifty miles to Morro Bay, they naturally could afford no slipups. The tow line must be one that had behind it a record of **proven** dependability and performance.

The 8-inch Tubbs Supercore line selected gave never a doubt as to its ability to stand-up to its strenuous task. The tug carried a 150-fathom coil. At times there were 140 fathoms out. And as Mr. Haviside says: "It handled perfectly and gave us a real demonstration of flexibility, elasticity and brute strength."

Whenever there's a job at sea that requires the utmost from a rope, you "play safe" when you put your confidence in Supercore—the recognized leader in the Marine field.

Tubbs Cordage Compan

200 BUSH STREET · SAN FRANCISCO
Mills in San Francisco

Patents June 23, 1925; October 20, 1925; August 3, 1926

PACIFIC MARINE REVIEW

SEPTEMBER, 1936
VOL. XXXIII NO. 9

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OUR COVER

The beautiful picture of the Alaska Packers' Association four masted bark (shipentine) Star of Shetland is published through the courtesy of E. Behrman, San Francisco. It is made from a photograph said to have been taken from the roof of the Ferry Building, at the center of the Port of San Francisco piers. Star of Shetland is, we believe, the last of the big windjammers of the great Star fleet; she is sold to Japanese interests and will shortly become scrap steel. See story on page 306 of this issue.

●

NEXT MONTH

The International Convention for Safety of Life at Sea was ratified recently by the U. S. Senate, and becomes effective as American marine law on November 7. Our next issue will carry a complete detailed report on this.

PUBLISHED AT 500 SANSOME STREET . . . . SAN FRANCISCO

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James S. Hines
Publisher

Bernard N. De Rochie
Advertising-Business Manager

Alexander J. Dickie
Editor

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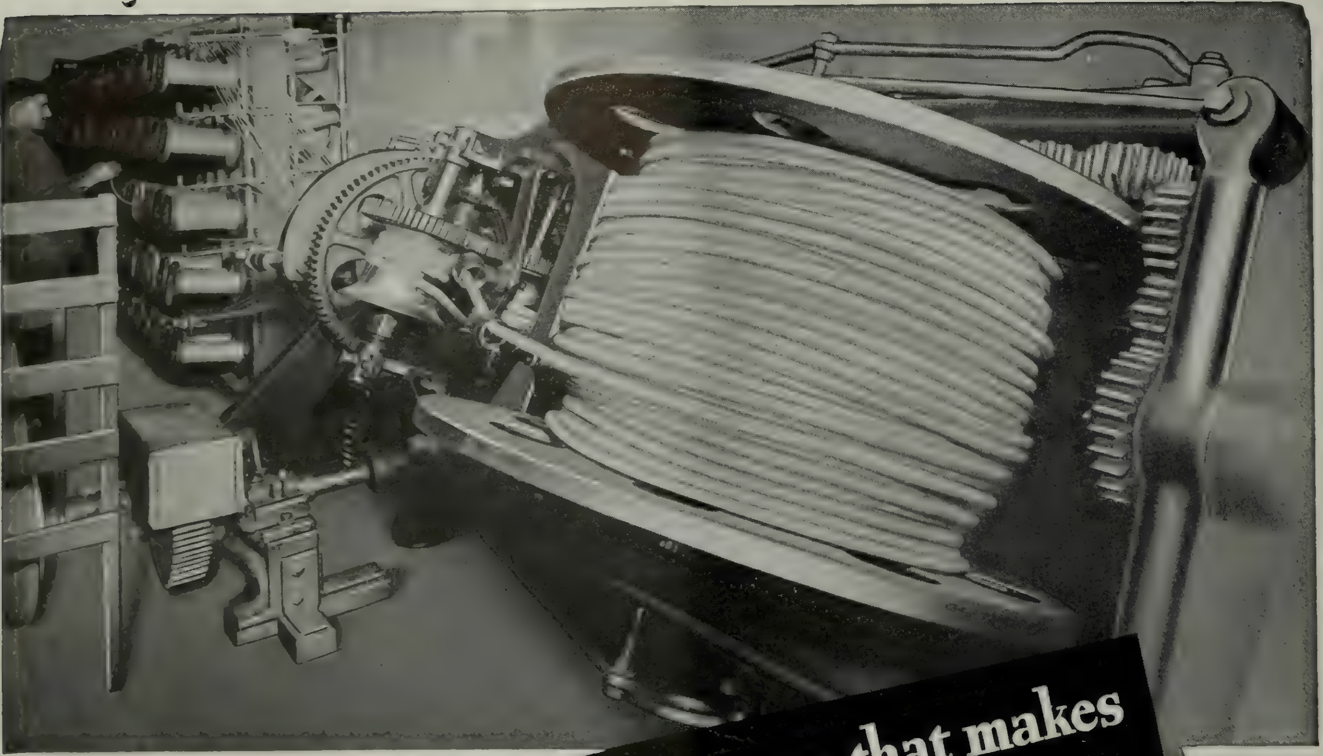
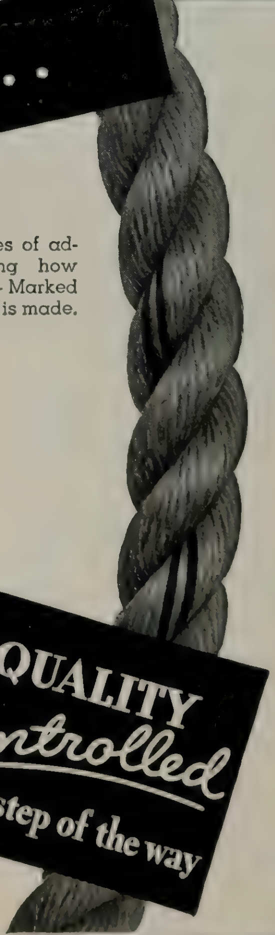


One of the Forming Machines which takes the yarns and makes them into rope strands.

It's the Equal "Draw" on the yarn that makes COLUMBIAN a stronger rope . . .



Fourth in the series of advertisements telling how Columbian Tape-Marked Pure Manila Rope is made.

FORMING Machines in the Columbian mills exert an equal "draw" on the yarns as they unreel from the bobbins. This results in a more uniform strand which assures a higher-quality, more-dependable rope.

Rugged strength and long life are built into Columbian Rope. From the selection of the finest fibre in the far-off Philippines to the final "laying" of the strands in our modern plant here in Auburn, nothing is left to chance. Accuracy governs every step.

QUALITY *Controlled* every step of the way

COLUMBIAN ROPE COMPANY
342-90 Genesee St.
AUBURN, "The Cordage City," N. Y.

COLUMBIAN TAPE MARKED PURE MANILA ROPE

PACIFIC MARINE REVIEW

VOLUME XXXIII SEPTEMBER 1936 NUMBER 9

Editorial Comment »« »«

Important Must Dates for American Shipowners

The recently approved Maritime Acts contain a number of mandatory clauses directing the shipowner to perform certain functions with time limits set and penalties implied or stated. Just as reminders, here are a few of the "must do" dates:

September 27 is the close of the ninety-day period after the approval of the Merchant Marine Act of 1936, signed by the President on June 29. It is important for shipowners to note the phrasing of Sec. 402 (a): "The holder of any mail contract that is to be terminated as provided in section 401 of this title may, within ninety days after the passage of this Act, file an application with the Commission to adjust and settle all the rights of the parties under such contract and to substitute in whole or in part therefor a contract or contracts authorized in titles V and VI of this Act in accordance with the conditions hereinafter prescribed. Such application shall be in such form and filed under such regulations as the Commission may prescribe."

This could seem to limit permissive action to the ninety-day period specified. Over two-thirds of that period has already gone by, and there is as yet no Maritime Commissioner appointed, no forms or regulations prescribed. While it is undoubtedly true that an equitable extension of time should, and probably will, be granted, nevertheless (in view of the record at Washington), we feel that the American shipowning holder of any mail contract would be in a much better legal and practical position to protect and conserve his rights if he, before September 27, legally files his application or at least his demand for prescribed forms and regulations wherewith to make such application.

September 24: Ninety days after the approval of the new "Welfare of the American Seaman Act," Section 4 of that Act will be in effect.

This section calls for inspection of crew's quarters of every American vessel at least once a month by the local inspectors of the Bureau of Marine Inspection and Navigation. This inspection includes space, ventilation, sanitation, plumbing, and all mechanical appliances. Any wilful evasion or negligence in complying with law, or in permitting improper conditions, is punishable by a $500 fine assessed against the master of the ship or other responsible officer. If ship is not properly equipped in crew's quarters, her certificate of inspection is to be withdrawn and not reissued until she is so equipped.

December 25, *Christmas Day,* brings in a lot of changes under the "Welfare of the American Seaman Act"—a lot of Christmas presents in the shape of books, cards, certificates, and what not for shipowners, masters, mates, engineers, seamen, oilers, wipers, stewards, and boys, which they must accept or get some other job.

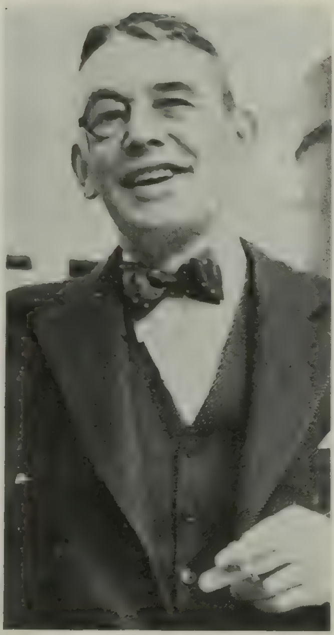
From and after this date:

(1) Seventy-five per cent of the entire crew of all American flag vessels shall be native born or fully naturalized citizens. $500 penalty for each evasion of this one.

(2) On all American flag foreign trade or intercoastal vessels, every seaman is to be furnished with a "continuous discharge book," containing his signature, nationality, age, personal description, photograph. and home address. Books to be issued by Shipping Commissioners and collectors and deputy collectors of ports, under direction of Bureau of Marine Inspection and Navigation. Whenever a seaman is discharged, the Shipping Commissioner (or if such official be unavailable, the master of the ship) shall enter in the continuous discharge book the name of vessel, the nature of voyage, the class of vessel, the date and place of shipment and of discharge, and the rating then held by the seaman holding the book. One to three months' imprisonment for issuing imitations of, making unwarranted entries in, or fraudulently using such books. $50 fine on any master who fails to make the specified entries.

(3) On all merchant seagoing vessels of the United States, the licensed officers, sailors, coal passers, firemen, oilers, and water tenders, shall, while at sea, be divided into at least three watches, which shall be kept on duty successively for the performance of ordinary work incident to the sailing and management of the vessel. Neither officers nor men on deck or in engine department shall be required to work more than eight

(Continued on Page [illegible])



John Norman Densham, seagoin' columnist and poet of the San Francisco Chronicle, and his famous lines on the death of George V.

Ten Million Flags Droop Half-Mast High;
For Even Royalty Must Die.

When monarchy leans down to death,
An empire holds its shudd'ring breath.
From king to king, how short the span;
One last, deep sigh—another man.
Aye, man indeed, for up they rise
To guide a nation's enterprise;
To govern people with a hand
All gloved in silk, but iron band
Around the clench'd and threatening fist
When foes, unbeaten, still insist.
The king is dead, a sailor he
Who read the ocean's mystery;
Who knew the joy of tiller feel,
Of listing mast and trembling keel.
In royal vault they laid him low
His body there—but we who know
Have watch'd his soul flame out to sea
To join the wraiths of such as we
Who, dying, knew no signs of birth
Save this, the grandest mark on earth—
"If you be of the ocean clan
Or king or deck hand, you're a man".

Ten Million Flags Droop Half-Mast High;
For Even Royalty Must Die.

J N D

Twenty-Five Years Ago

The September 15, 1911, *issue, number* 9, *volume VIII, of Pacific Marine Review, "First established and only exclusively marine paper published on the Pacific Coast," was published from* 379, 380 *Arcade Annex, Seattle, Washington.* From a great mass of interesting material in that issue, we glean the following items:

The American-Hawaiian Steamship Company had just purchased the S.S. Massachusetts from the Atlantic Transport Company at a reported price of $1,500,000 and was converting her to an oil burner.

The Canadian Pacific Railway was ordering two new palatial liners from the Fairfield Shipbuilding Company of Glasgow. 595 feet long, 15,000 net tons, twenty "knots per hour" speed, with accommodations for 1,300 passengers, and a large cargo capacity, these "boats will be literally floating palaces." The delivery time, January, 1913; the cost, $2,500,000 each.

Craig Shipbuilding Company, Long Beach, California, was building its largest ship—305 feet long, 44 feet beam, a 2,000-horsepower engine. The cost was to be about $300,000.

The new S.S. Shinyo Maru, recently delivered by the Mitsubishi Dockyard and Engine Works, Nagasaki, to the Toyo Kishen Kaisha, had just arrived at San Francisco on her maiden voyage. All cabins outside rooms, numerous tub and shower baths, a large swimming tank, an "artistic dream" of a dining saloon, a Palm Garden cafe, and many other features, combined to make this vessel a great favorite. Triple screws driven by direct connected turbines were reported to obtain "21 knots per hour without the slightest vibration to her hull."

Progress in developing wireless telegraph communication along the Pacific Coast was reported from points in Alaska, Chile, and nearly every nation on the Pacific shores of both Americas.

An article with illustrations described forced lubrication of large reciprocating marine steam engines as then being introduced into the United States navy.

Suggestion was made that the United States Weather Bureau, about to move to the roof of the new 18-story Hoge Building, install a "Time Ball, which every shipping port of importance possesses, and which is of vital importance for daily time corrections" for railroads, shipping, and industry.

Joseph A. Moore

The Popular Master Shipbuilder

G. M[illegible] [illegible]

Joseph A. Moore.

Across "the pond" for the first time in 1884 on the old Circassia, a 399-foot steamer of 4,000 tons, to Great Britain the last time, in May of this year, on the 50,000-ton North German Lloyd Europa, thence returning two weeks ago on the palatial Queen Mary, with her 81,000 tons, as well as many other crossings sandwiched in through the years between: that is the transatlantic record of Joseph A. Moore, president of the Moore Dry Dock Company and Commissioner of the California State Harbor Board.

Going to Australia in the engine room of the old Mariposa in 1896, thence on around the world in various vessels, and numerous voyages on the Pacific and in European waters, also a recent trip to the Scandinavian countries, Mr. Moore has the experience essential for the expression of opinion on the performance and operation of the modern vessels.

During his previous visit in 1934, says Mr. Moore, there was a comparatively small amount of ship construction under way on the Clyde, but now there are over 80 vessels building on this river alone. He visited a number of the British shipyards, also the Babcock & Wilcox boiler works in Renfrew, where high-pressure boilers in large numbers are being built to fill orders from all parts of the world. The tube mill of this concern, at Dumbarton, is running around the clock on production. Generally throughout Great Britain, he found a great improvement in the employment situation, as well as in the spirit of the people.

In both Norway and Sweden, Mr. Moore saw a good deal of smaller ship construction proceeding; and at Gothenburg, in the south of Sweden, there was some large shipbuilding in hand. The shipyard and engine works of Burmeister & Wayne, Ltd., at Copenhagen, Denmark, were very busy with some big construction. Half a dozen 3,000-horsepower diesel engines were building in the ships, a large tanker for the Standard Shipping Company was on the ways, as well as two vessels for Russia, and a number of smaller vessels for other owners.

As an interesting sidelight on the Danish shipbuilding situation, Mr. Moore noted that, since January, the Danish shipbuilders had imported 15,000 tons of ship steel from American steel mills.

Everywhere through Scandinavia, employment was reported at normal, the people appearing happy and contented, showing no evidence of poverty or depression.

The Moore plant at Oakland has been very busy during Mr. Moore's absence, and a large amount of repair work and steel construction is booked ahead. Various new machine tools and traveling cranes have recently been added to the plant, a large new structural shop is in course of construction, and on Friday, August 29, an additional pontoon for the No. 5 floating dock was launched, thus giving the concern two floating docks of 15,000 tons capacity, as well as three marine railways.

Seamen, Ships, and
The New Merchant Marine Laws

By Joseph B. Weaver*

Director, Bureau of Marine Inspection and Navigation, U. S. Department of Commerce

A larger and more important objective: We should train our division over and beyond minor problems and disagreements. I say this to both employer and employee.

We must put America back into the foreground of the maritime nations of the world. We must create the finest ships which American skill can produce and we must man them with finest type of American officers and men, zealous to reach the highest grade of efficiency and the top of their respective grades and professions, and with an ambition and patriotism that the ships flying our country's flag shall certainly equal, and in many instances excel, anything of which any other nation can boast.

This must be done upon the basis of the American standard of living for the workmen in the industry, both ashore and afloat, and it should instil in these workmen a desire to produce the finest workmanship in their particular craft. When we have our eyes set upon this goal and we catch this spirit—then shall we march to a success which should be our proper destiny.

International status of the U. S. Merchant Marine: Figures show that, in ships of 2000 gross tons and up available for international trade: From the standpoint of tonnage Great Britain outranks us more than four to one, with Japan owning about the same as the United States.

In ships with speeds of 12 knots and over we stood fourth, with Great Britain outranking us better than 5 to 1, Germany owning over 400,000 tons more, and Japan about 50,000 tons more.

In ships 10 years of age and under the United States stood at the foot of the list, outranked by Great Britain 11 to 1, by Germany 2 to 1.

Necessary Replacement Program: A further analysis shows that ships with speeds between 10 and 11 knots predominate in our foreign trade fleet of 485 vessels totaling 3,037,000 tons. Over 85 per cent of the total tonnage is 14 years old or over, averaging 17 years, with nearly 11 per cent, or 45 vessels of 281,000 tons, 20 years old or over.

In our domestic trade fleet, which consists of 455 vessels of over 2,000 tons, ships with speeds between 10 and 11 knots again predominate but to a greater extent than in our foreign trade fleet. Over 91 per cent of the total tonnage is 14 years old or over, averaging 19 years, with nearly 27 per cent, or 104 vessels of 489,000 tons, 20 years old or over.

In our tanker fleet of 340 vessels of 2,377,000 tons, 92 per cent of this tonnage are vessels with speeds of less than 12 knots; 88 per cent of the total tonnage is 14 years old or over averaging 18 years, with 14½ per cent, or 54 vessels of 303,000 tons, 20 years old or over.

These figures disclose the imperative need for the prompt modernization of our foreign, domestic and tanker fleets of which nearly 88 per cent, or 1,176 vessels of about 6,527,000 gross tons, is 14 years old or over and of which nearly 16½ per cent, or 203 vessels of over 1,000,000 tons, are already 20 years old or over.

This will require an annual replacement program amounting to 433,000 tons in the foreign trade fleet, 305,000 tons in the domestic trade fleet and 349,000 tons in the tanker fleet, or a total or over 1,000,000 gross tons per annum during the next six years in order to replace by 1942 the 6,527,000 tons of vessels which will be 20 years old or over. This means the annual construction of some fifty to sixty vessels—a large shipbuilding program."

● *Safety at Sea Legislation*:

The 74th Congress passed more constructive laws relating to safety of life and property at sea than was passed in more than 25 years by preceding Congresses. I will mention each of the Acts giving a brief description of their purpose.

The United States Senate ratified the 1929 Convention for Safety of Life at Sea. In many instances our Rules and Regulations had already gone appreciably farther than the minimum requirements of this International Convention.

The Motor Ship Act extending the inspection control

**Some excerpts from a luncheon address delivered August 21 before the Commonwealth Club, San Francisco.*

of the Government to motor driven vessels above 300 tons. Heretofore, while the Government did have this control over vessels driven by steam, in many cases motor driven vessels were not inspected. Obviously, this condition did not make sense.

The Coastwise Load Line Act, giving the Government the authority to assign load lines to all domestic vessels and controlling the overloading of such vessels. Again it is obvious that it is just as important to control overloading of our vessels in our domestic services as it is in the foreign service.

The Dangerous Cargo Act, extending Government control to all vessels loaded with dangerous cargoes, such as gasoline or other highly inflammable or explosive liquids. Many of such vessels were not under Government control and the trail of tragedy that has followed their operation is little appreciated. Now, vessels of all sizes, ownership and services, carrying such dangerous cargoes, are subject to a most complete set of rules for construction, inspection and operation.

The Direct Steering Order Act, making it necessary to have all steering gear operate in the direct manner and requiring the use of direct orders. When the order is issued to the helmsman for "right rudder", this means that the steering wheel is thrown to the right, the rudder moves to the right and the bow of the vessel goes to the right.

An Act requiring automatic sprinklers on passenger vessels which gives to the Government the right to require these systems on vessels where conditions make this protection necessary.

An Act for the reorganization of the Bureau of Marine Inspection and Navigation which is most far reaching in placing that Bureau on a modern basis. This Act provides, among other things, for the establishment of a highly trained technical force in the Bureau, for the approval of all important plans of passenger vessels and alterations to existing passenger vessels, including stability and subdivision. All new ships, if the present policy of the Bureau if maintained, will be practically fire-proof and will be so subdivided as to prevent foundering should the vessels be subjected to the usual marine accidents.

A corps of 10 Principal Traveling Inspectors is provided whose principal duties will be to go to sea on vessels and observe the conditions while at sea.

The Act sets up an entirely new procedure for the investigation of marine casualties; Provision is made for three boards; one, known as the "A" board, will investigate casualties involving loss of life. A representative from the Department of Justice, one from the Coast Guard and one from the Department of Commerce will constitute this board.

A board, known as the "B" board, will investigate major causes not involving loss of life; a Supervising Inspector and two Principal Traveling Inspectors will constitute this board; and a "C" board, the personnel to be designated by the Secretry of Commerce from the Bureau of Marine Inspection and Navigation, will investigate all matters of a minor character.

The Act requires a complete reorganization of the Bureau, the sole purpose of which is to secure uniformity in the decisions and rulings of the Bureau in the method of examination of officers and crew, and in the general conduct of the affairs of the Bureau. The number of Supervising Inspection districts has been reduced from 11 to 7.

The control of the physical ship, its equipment, in other words, the control of the material, is comparatively simple as compared with control of the personnel element. A ship is just as safe and no safer, than the skill and efficiency of her officers and crew can make her.

The Personnel Bill: An Act to promote the welfare of American Seamen.

The Act establishes a three watch system on deck as well as in the engine room on the majority of our seagoing craft. It limits the hours of work to 8 hours a day. It safeguards, if properly administered, this phase of the working condition aboard ship, a condition ear-

S.S. Manhattan, of the U. S. Lines. This vessel, with her sister, S.S. Washington, is one of the most popular passenger liners on the Atlantic.

nestly desired for years by seamen.

This Act requires the Bureau of Marine Inspection and Navigation to make a monthly inspection of all crew quarters on American vessels over 100 tons to see that these quarters are in accordance with our law, are kept in a sanitary condition and that the ventilation, insulation and toilet facilities are satisfactory, and in general that these quarters, which are the seamen's home, are made as livable as possible.

This law provides for the cancellation of all existing lifeboat man and able seaman certificates because it is common knowledge that these certificates are oftentimes sold, counterfeited and in the possession of those to whom they were not issued. It provides for a new series of certificates on which will appear a photograph of the seaman and the certificate will be of such a nature that it will be difficult for any one to improperly present or possess such a certificate, and incident to the issuance of these new certificates a more intelligent examination is contemplated, so that the certificate will actually mean what its name implies, a certification of the efficiency of the holder.

At this point I wish to assure all men now holding rightful certificates as lifeboat men and able seamen that only such inquiry as is necessary to prove that their certificates are rightfully held, will be required by the Bureau when they apply for the new certificate. The Act requires that every member of the crew below the rank of licensed officer must be in possession of a certificate of efficiency.

A certificate is required for the engine room force above the rating of wiper and coal passer, for "Tanker men", those who are specially trained in handling dangerous cargoes, and a certificate of service for all other members of the crew, on which will be endorsed the rating or occupation for which the particular man is qualified. This section of the law goes into effect as to vessels engaged in foreign and intercoastal voyages, December 25, 1936, and as to all other vessels except those exclusively operating on inland lakes and rivers, June 25, 1937.

With these certificates there will be furnished to every seagoing man below the rank of master, a so-called Continuous Discharge Book, the purpose of which is simply to give a complete record in a substantial book form with photograph of the holder, of every voyage that the holder has made and the position which the holder has had on the voyage in question.

This book is practically a Government passport, identifying our seagoing citizens. It is interesting to note that only recently have members of American crews been refused landing privileges in Russian ports, as Soviet Government now requires Governmental papers giving complete identification. Centralized records will be kept in Washington of every seaman; a central Bureau where all seamen can get their complete record, if for any purpose it is necessary.

● *Merchant Marine Act of* 1936

Our national policy in regard to our merchant marine has been completely lacking in any continuity of purpose. It is essential that long time policies be adopted because of the very nature of the business. No one can afford to engage in shipping unless they can have reasonable assurance that there will be no sudden drastic changes in government policies.

We cannot build in American shipyards, nor can we operate upon the high seas, the fine type of seagoing ships which American naval architects, marine engineers, and ship builders can create, on a basis of economic parity with vessels built in foreign shipyards under a low wage scale or manned by crews receiving low wages. Our ships are American institutions in the same manner as any other American enterprise and they must be operated upon a basis of the American standard of wages and living conditions irrespective of what may be the attitude of any other nation with respect to its national shipping. Plain economics therefore dictate that in the open world market, where no tariff protection to American labor is possible, an offset must be procured to provide equality of opportunity in a commercial sense.

The Merchant Marine Act of 1936 provides for the creation of an agency to be known as the United States Maritime Commission, comprised of five members to administer the law. The aid rendered by the Government to private American shipping is of a direct nature, the Government absorbing the construction and operating differentials.

This Commission, if its personnel is properly qualified, can develop a governmental agency as effective and as far reaching as the British Board of Trade and its mercantile marine division. It is therefore my belief that when we have men of sound judgment and patriotic motives for the administration of the law, the law can be made to achieve its objective. A glance at the law will indicate many duties of the board in addition to the problems of financial assistance and personnel matters of our ships.

The commission is required to keep in contact with various associations and organizations of the shipping industry. This should mean continual and cordial relations with organizations of ship builders, shippers, underwriters, financiers, labor unions, and any others in order that they may at all times have intimate knowledge of the problems of not only the operators of the ship, but the public at large who use these services.

The Commission is required to fight the battle with the Interstate Commerce Commission, and I say fight the battle with this Commission advisedly, because up to date little consideration has been given by Interstate Commerce Commission to the problems of our water transportation.

In this Act there is a most wise provision which permits the Maritime Commission to lend moneys to inland and coastwise companies. This money is to be loaned as a twenty-year mortgage on any vessel at an interest rate of 3½ per cent.

Our present inland waterway fleet numbers about 1000 passenger vessels and over 400 of these vessels are of wood; about 600 of them are 20 years and older; and only 52 are less than 5 years old. I have received indications from all sections of the country that operators of these vessels will be only too anioxus to construct new and modern ships. It is a strange thing, but I know of no instance where a modern, well designed vessel, either on inland water and or on the deep sea, has not proven a complete financial success.

The money which will come out of the public Treasury to help ships engage in our foreign commerce, is not in the nature of a subsidy. The scheme of the new form of assistance is to place our ships in foreign commerce on a parity with foreign competitors. It then remains for the operators of our ships, through efficiency and energy and other American characteristics, to outdistance foreign competition. This form of assistance is only for the purpose of maintaining American standards, American wages and working conditions in the shipyards that build the ships and on the vessels operated in competition with foreign flag bottoms.

Citizens of the United States may make application to the Commission for the construction of new vessels to be used on essential services. The Commission is authorized to enter into a contract with a shipbuilder for the construction of the vessel and the payment to the shipbuilder of the cost. Concurrently with entering into such a contract with the shipbuilder, the Commission is authorized to enter into a contract with the applicant for the purchase of the vessel at a price corresponding to the estimated cost (exclusive of military features) of building such a vessel in a foreign shipyard. The applicant is required to pay one-fourth of this estimated cost (exclusive of military features) to the Commission, in payments to be made at the time and in the same proportion as provided for the payment of the construction cost in the contract between the shipbuilder and the Commission. The balance of the purchase price is to be paid by the applicant within 20 years after delivery of the vessel, in not to exceed 20 equal annual installments, the first of which is to be paid one year after the delivery of the vessel to the applicant. Interest at the rate of 3½ per cent per annum is to be paid on all installments of the purchase price remaining unpaid.

Where government-aid is furnished in the building of new vessels for operation under the provisions of the Act for a steamship line whose homeport and headquarters are on the Pacific Coast, the contract for building such ships shall be awarded to a Pacific Coast shipyard if the cost of construction is not in excess of 6 per cent higher than the lowest responsible bid in other American shipyards. And this 6 per cent additional cost is largely made up by a lower rate of interest charged by the government on the money which it loans for the purpose.

If the Commission finds that the objectives set forth in the declaration of policy and its long-range replacement program cannot be fully realized within a reasonable time, it is authorized and directed: to have ships constructed in domestic yards; to have old vessels reconditioned or remodeled; to charter or sell vessels under certain conditions; to operate temporarily for the Commission's account by private operators, upon such terms as the Commission may deem advantageous; to offer all such lines or vessels for charter; to cancel all present operating agreements within one year after the passage of the Act; and to arrange for the employment of its own vessels on essential trade routes exclusively serving the foreign trade of the United States.

Whenever the profits are in excess of ten per cent net on Government-aided vessels, whether privately operated or chartered, the Government will share in such profits.

The profits of shipbuilders are limited to ten per cent. Anything in excess of this amount is recaptured by the Government.

Limitations are also placed on salaries in both the shipbuilding and shipping industries in regard to vessels receiving government aid. In the case of shipyards, no salaries in excess of $25,000 per annum can be included as an item of cost in the building of such a vessel. In the case of shipping companies, no salaries in excess of $25,000 are permitted to be paid employees or officials, either directly or indirectly connected with such companies.

Books of both the shipbuilding and shipping companies are subject to inspection by the Commission.

All foreign ocean mail contracts made by the Postmaster General under the provisions of the Merchant Marine Act, 1928, will be terminated on June 30, 1937.

The Commission is commanded by the Act to: investigate wages and working conditions on American ships receiving governmental aid; establish minimum wages and outline working conditions; see that ships receiving governmental aid pay to their crews and personnel the full amounts of the wages and provide the working conditions which the Commission considers correct for our seagoing labor.

The complete text of the Merchant Marine Act of 1936 runs to approximately 20,000 words—the equivalent, roughly, of 20 columns of a daily newspaper. Some of its provisions apparently admit of more than one interpretation. It can readily be seen therefore that the successful administration of the Act will require men of high intellectual calibre, courage, and vision, and that the future of the American Merchant Marine will rest largely with the five members of the Maritime Commission whose duty it will be to interpret and administer the law. The President of the United States—often referred to as our "sea-minded" President — may be counted upon to appoint to these important positions men who are qualified by training and experience to set the right course for the future of American shipping.

The Tanker Inspection Act

Text of the New Statute Extending the Laws Governing the Inspection of Vessels Specifically to Include all Vessels Carrying Inflammable or Combustible Liquid Cargo

On June 23 last, the President of the United States signed S. 4780, an act amending title 52 of the Revised Statutes by inserting, after section 4417 thereof, a new section extending the powers of the Bureau of Marine Inspection and Navigation to cover practically every safety factor in the construction, equipment, and manning of all vessels transporting inflammable or combustible liquid cargo in bulk.

The rules this new section authorizes have already been formulated and published. They represent the best thought of the Bureau and the best experience of the industry. Heretofore there have been no special "Rules and Regulations for Tankers" issued by the Board of Supervising Inspectors. This class of ship was covered only by one or two exceptions or additions in the general rules. The new tanker rules embody a distinct advance in standards of personnel and equipment, and bring these standards up to the most modern and efficient practice.

The text of the enabling act, showing the scope of the extension of the supervisory power, is as follows:

"Sec. 4417a. (1) All vessels, regardless of tonnage, size, or manner of propulsion, and whether self-propelled or not, and whether carrying freight or passengers for hire or not, that shall have on board any inflammable or combustible liquid cargo in bulk, except public vessels owned by the United States, other than those engaged in commercial service, shall be considered steam vessels for the purposes of this title and shall be subject to the provisions thereof: **Provided**, That this section shall not apply to vessels having on board only inflammable or combustible liquid for use as fuel or stores or to vessels carrying liquid cargo only in drums, barrels, or other packages.

"(2) In order to secure effective provision against the hazards of life and property created by the vessels to which this section applies, the Board of Supervising Inspectors, with the approval of the Secretary of Commerce shall establish such additional rules and regulations as may be necessary with respect to the design and construction, alteration, or repair of such vessels, including the superstructures, hulls, places for stowing and carrying such liquid cargo, fittings, equipment, appliances, propulsive machinery, auxiliary machinery, and boilers thereof; and with respect to all materials used in such construction, alteration, or repair; and with respect to the handling and stowage of such liquid cargo; the manner of such handling or stowage, and the machinery and appliances used in such handling and stowage; and with respect to equipment and appliances for lifesaving and fire protection; and with respect to the operation of such vessels; and with respect to the requirements of the manning of such vessels and the duties and qualifications of the officers and crews thereof; and with respect to the inspection of all the foregoing: **Provided**, That the provisions of this section shall not apply to common carriers engaged in interstate or foreign commerce which transport such liquid cargo by water insofar only as such common carriers are subject to the regulations formulated by the Interstate Commerce Commission under the provissions of section 233 of the Act of March 4, 1909 (ch. 321, 35 Stat. 1135), as amended (U.S.C. 1934 ed., title 18, sec. 383). In establishing such rules and regulations the Board of Supervising Inspectors may, with the approval of the Secretary of Commerce adopt rules of the American Bureau of Shipping or similar American classification society for classed vessels insofar as such rules pertain to the efficiency of hulls and the reliability of machinery of vessels to which this section applies. In establishing such rules and regulations, the Board of Supervising Inspectors shall give due consideration to the kinds and grades of such liquid cargo permitted to be on board such vessel.

"(3) Before any rules and regulations, or any alteration, amendment, or repeal thereof, are approved by the Secretary of Commerce under the provisions of this section, except in an emergency, the said Secretary shall publish such rules and regulations and hold hearings with respect thereto on such notice as he deems advisable under the circumstances.

"(4) No vessel subject to the provisions of this section shall, after the effective date of the rules and regulations established hereunder, have on board such liquid cargo, until a certificate of inspection has been issued to such vessel in accordance with the provisions of this title and until a permit has been endorsed on such certificate of inspection by a board of local inspectors indicating that such vessel is in compliance with the provisions of this section and the rules and regulations established hereunder, and showing the kinds and grades of such liquid cargo that such vessel may have on board or transport. Such permit shall not be endorsed by a board of local inspectors on such certificate of inspection until such vessel has been inspected by such board of local inspectors, or by any other board or officer of the Bureau of Marine Inspection and Navigation designated by the director thereof, and found to be in compliance with the provisions of this section and the rules and regulations established hereunder. For the purpose of any such inspection approved plans and certificates of class of the American Bureau of Shipping or other recognized classification society for classed vessels may be accepted as evidence of the structural efficiency of the hull and the reliability of the machinery of such classed vessels except as far as existing law places definite responsibility on the Bureau of Marine Inspection and Navigation. A permit issued under the provisions of this section shall be valid for a period of time not to exceed the duration of the certificate of inspection on which such permit is endorsed, and shall be subject to revocation by a board of local inspectors whenever such a board shall find that the vessel concerned does not comply with the conditions upon which such permit was issued: **Provided,** That the provisions of this subsection shall not apply to vessels of a foreign nation having on board a valid certificate of inspection recognized under law or treaty by the United States: **And provided further,** That no permit shall be issued under the provisions of this section authorizing to be on board any vessel, described in the provisions of sections 4472 and 4278 of the Revised Statutes, section 234 of the Act of March 4, 1909 (ch. 321, 35 Stat. 1135), as amended (U.S.C., 1934 ed., title 18, sec. 384), and section 8 of the Act of August 2, 1882 (ch. 374, 22 Stat. 189; U.S.C., 1934 ed., title 46, sec. 171), any of the materials expressly prohibited to be carried on such vessels by the aforementioned provisions.

"(5) Vessels subject to the provisions of this section shall have on board such shipping documents as may be prescribed by the Board of Supervising Inspectors with the approval of the Secretary of Commerce indicating the kinds, grades, and approximate quantities of such liquid cargo on board such vessel, the shippers and consignees thereof, and the location of the shipping and destination points.

"(6) (a) In all cases where the certificate of inspection does not require at least two licensed officers, a board of local inspectors shall enter in the permit issued to any vessel under the provisions of this section, the number of the crew required to be certificated as tankermen.

"(b) A board of local inspectors shall issue to applicants certificates as tankermen, stating the kinds of liquid cargo the holder of such certificate is, in the judgment of such board, qualified to handle aboard vessels with safety, upon satisfactory proof and examination, in form and manner prescribed by the Board of Supervising Inspectors with the approval of the Secretary of Commerce, that the applicant is in good physical condition, that such applicant is trained in and capable efficiently to perform the necessary operations aboard vessels having such liquid cargo on board, and that the applicant fulfills the qualifications of tankerman as prescribed by the Board of Supervising Inspectors under the provisions of this section. Such certificates shall be subject to suspension or revocation on the same grounds and in the same manner and with like procedure as is provided in the case of suspension or revocation of licenses of officers under the provisions of section 4450 of this title.

"(7) The owner, master, or person in charge of any vessel subject to the provisions of this section, or any or all of them, who shall violate the provisions of this section, or of the rules and regulations established hereunder, shall be subject to a fine of not more than $1,000 or imprisonment for not more than one year, or both such fine and imprisonment.

"(8) The rules and regulations to be established pursuant to this section shall become effective ninety days after their promulgation unless the Secretary of Commerce shall for good cause fix a different time."

Must Dates for Shipowners

(Continued from Page 297)

hours in one day, except when this is necessary for the safety of the ship, other ships, passengers, crew, or cargo. In safe harbor, no seaman shall be required to do unnecessary work on Sundays, New Year's Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day. Failure to comply subjects the owner to $500 fine for each offence, and gives seamen right to demand discharge with full pay.

(4) Sixty-five per cent of deck crew, exclusive of licensed officers, shall be of a rating not less than able seaman. Every person shall be rated an able seaman who is 19 years of age and upward, and has had at least three years' service on deck at sea or on the Great Lakes. Graduates of approved school ships, on passing proper physical examination, and other persons after physical and mental examination, may be rated able seamen after 12 months' experience on deck at sea, but in no crew shall the total number of able seamen required contain more than 25 per cent of those rated able seamen after only 12 months' experience.

No seaman shall be considered an able seaman or a lifeboatman unless he is in possession of a certificate issued by a board of local inspectors subsequent to the passage of this Act and after an examination of the applicant as to his competency under rules and regulations prescribed by the Secretary of Commerce. Prior to December 25, 1936, all such certificates issued before the passage of this Act shall be surrendered to the boards of local inspectors for cancellation. Similar certificates under similar conditions are to be issued to each member of engine room crews below the rating of licensed officer and above that of wiper or coal passer.

Certificates of service issued without examination (except physical examination of all food handlers for communicable disease) will be given to all other ratings in all crews of all American flag seagoing vessels, provided the applicant takes oath before at least one of the inspectors that he will faithfully and honestly perform all the duties required of him by law and carry out the lawful orders of his superiors on shipboard.

All of these certificates of service or efficiency shall be subject to suspension or revocation on same grounds, in same manner, and with like procedure as licenses of officers.

"It shall be unlawful to employ any person or for any person to serve aboard any merchant vessel of the United States, below the rating of licensed officer, who has not a certificate of service issued by a board of local inspectors, and anyone violating this section shall be liable to a penalty of $100 for each offense."

If the Department of Commerce finds it impracticable to hold all the necessary examinations and issue all the prescribed certificates within the six-months' period, the Secre-

(Continued on Page 317)

Four Pacific Ocean Stars Pass

Last of the Famous Alaska Packers Association Sail-Fleet, the Big Steel Shipentines, or Barks, go to the Japanese Scrap Steel Piles

One of the most active shipyards in America at the turn of the century was the famous old sailing shipbuilding plant of Arthur Sewall and Company, of Bath, Maine. There, in the years 1899 to 1902, were built four large steel four-masted shipentines designed especially for the case oil trade and to the specifications of the Standard Oil Company. Since all four of these vessels later became members of the famous Alaska Packers fleet, and are now disappearing as scrap into the steel furnaces of the Pacific Coast or of Japan, it seems fitting that their description and somewhat of their history should be recorded here.

The four ships were all of the same model, with slightly differing dimensions, as shown on the table herewith. A well molded transom stern, the graceful flaring bow with spike bowsprit, and the decided rake of the four masts, combined with the ample sheer to give that beautiful appearance of life which was so characteristic of Sewall ships.

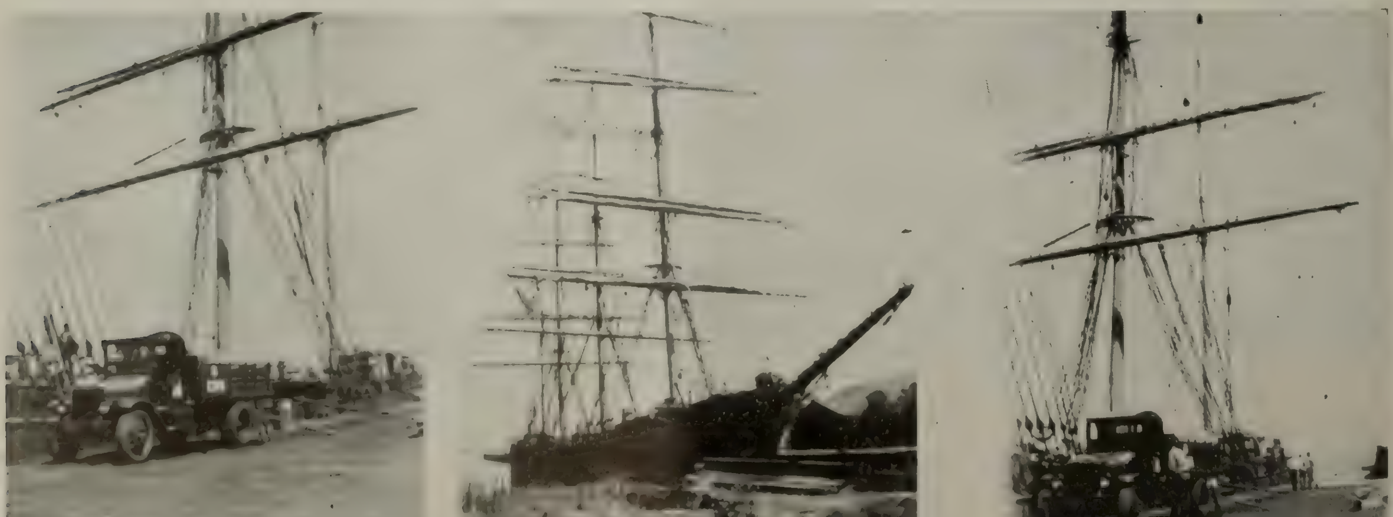
Edward Sewall, the first of the four, was launched in 1899. She had been built on the builders' account, and joined the line of sailing vessels then operated by the Sewalls. The other three ships were built for the Standard Oil Company for their case oil trade to various parts of the world.

At the time, these shipentines were the largest steel sailing vessels ever built in the United States. They had an overall hull length of 345 feet, and a designed load draft of 22 feet 6 inches, on which they would carry 5,000 tons deadweight, and the mainmast truck was 173 feet above the main deck. The spike bowsprit projected 45 feet beyond the bow. The deck camber was 12 inches, the dead rise 20 inches, and the tumble home 8 inches, all at midship section. They carried six yards each on the fore, main, and mizzen masts, and fore and aft rig on the jigger.

The hulls were fitted with two continuous steel decks (main and lower), and both decks were planked on top of the steel. Both 'tween decks and hold had three rows of stanchions.

The bulwarks had considerably more sheer than the deck, giving a full height forecastle and poop with no break in the bulwark line, and producing a very graceful appearance. The forecastle and poop decks were worked parallel to the main deck, with turtlebacks connecting them to the bulwarks and tapering to nothing fore and aft.

Two steel houses were erected on the main deck. The forward house just aft of the foremast was 46 feet long and 18 feet wide. At its after end, this house had a large well-ventilated and lighted room with 20 bunks for the crew; forward of this room were the galley, a coal bunker, and the donkey engine room. The



(Illustration made from snap-shots taken by F. J. Cordall, marine sales department, Texas Oil Company.)

The steel four masted bark, or shipentine, Star of Lapland, being prepared for her trip across the Pacific to be cut up as steel scrap for Japanese blast furnaces.

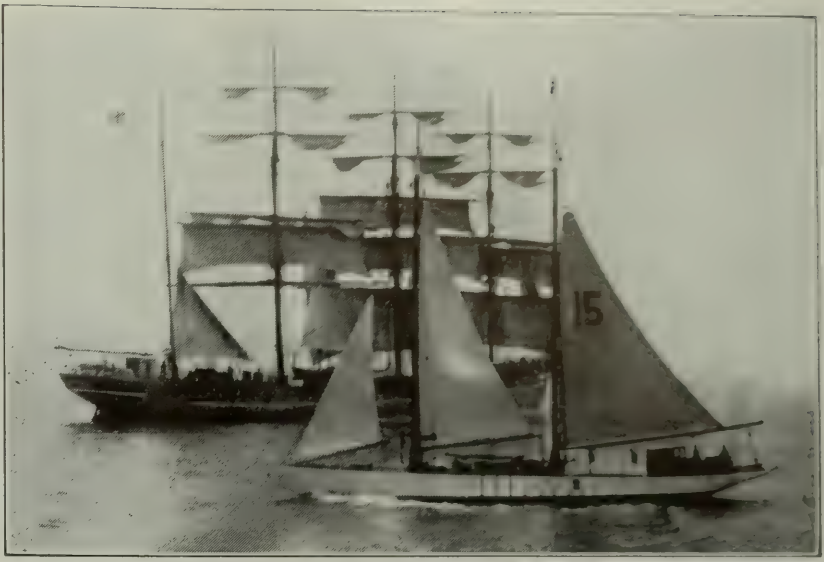
amidship deck house was 26 feet by 18 feet, and housed the carpenter shop, and six rooms for petty officers.

Aft in the poop were the captain's quarters, the officers' staterooms, steward's pantry, storerooms, lavatories, and bathrooms. The poop was 48 feet long. A spiral stairway connected captain's quarters with the chart house on the poop deck. A screw steering gear was installed, the helmsman and wheel being protected by a steel hood open forward. An open flying bridge erection, made portable in way of the hatches, joined the forecastle and the poop via the tops of the two houses.

These hulls were so designed that they had ample stability for handling in port without ballast. A donkey steam engine of 25 horsepower worked the ship's windlass through a messenger cable, and was arranged to handle cargo in port. The windlass was of the "Hyde" type.

The Edward Sewall, later the Samuel S. Sewall, was operated in the Sewall Line directly or chartered out by the Sewalls until 1915, when she was purchased by the Texas Oil Company and operated by them out of Port Arthur, Texas. In 1922, she was purchased by the Alaska Packers Association, renamed Star of Shetland, and joined their fleet in the annual run to Alaska for the salmon fishing. In 1933, she was laid up at Oakland, California.

The Astral, launched in 1900, was built for the Standard Oil Company of New York and was operated by them until November 18, 1913, when she was sold to the Alaska Packers Association, renamed Star of Zealand, and put in the Alaska fishing run. She also was laid up at Oakland in 1933.



One of the Alaska Packer's big four masted steel barks, or shipentines, on her last voyage, passing the San Francisco pilot schooner.

The Atlas, launched in 1902, has substantially the same history as the Astral, except that November, 1910, was the date of her transfer to the Alaska Packers Association, and she was renamed Star of Lapland.

These three ships were all sold for scrapping purposes in 1935, destined for the Japanese scrap steel market.

The Acme also was built for the Standard Oil Company of New York. Launched in 1901, she was sold to the Alaska Packers Association in April, 1913. Renamed Star of Poland, she evidently had some premonition of the fate reserved for her and her sister steel ships, because, on the 15th of September, 1919, she piled up on the rocks at Katsumura, Japan, and became a constructive total loss.

Original Name	Year	Gross	Net	Length	Beam	Depth	Last Name
Edward Sewall	1899	3345	2850	332.0 ft.	45.3 ft.	25.5 ft.	Star of Shetland
Astral	1900	3292	2987	332.3 ft.	45.4 ft.	26.0 ft.	Star of Zealand
Acme	1901	3288	2987	332.2 ft.	45.4 ft.	26.1 ft.	Star of Poland
Atlas	1902	3381	3006	332.4 ft.	45.4 ft.	26.1 ft.	Star of Lapland

Table showing principal characteristics of the four big steel stars.

The Alaska Packer's Association fleet of deep sea sailing ships at their home port in the Oakland estuary about 1920.

A Streamlined Princess

Sun Shipbuilding and Dry Dock Company Deliver Unique Twin Screw Auto and Passenger Transport Powered with Skinner Unaflow Steam Engines

The passenger and automobile transport Princess Anne was delivered on July 10 to the Virginia Ferry Corporation, Norfolk, Virginia, by the Sun Shipbuilding and Dry Dock Company of Chester, Pennsylvania. With the Del-Mar-Va, built in 1934, she will operate on the 26-mile Little Creek-Cape Charles route across lower Chesapeake Bay, serving the motorists who use the popular new ocean highway.

The Del-Mar-Va has given very satisfactory service, and the design of the Princess Anne is based on that of her older sister, but with a number of important improvements and with an entirely new conception of superstructure design. As will be noted from the illustrations, the profile of the Princess Anne is completely streamlined, in conformity with modernistic trends.

The principal characteristics of Princess Anne are:

Length overall	260 feet
Beam over guards	59 feet
Depth molded amidships	19 ft. 1 in.
Draft normal	10 ft. 2 ins.
Number of driveways	6
Car carrying capacity	60 to 80
Passenger capacity	400
Shaft horsepower	2,800
Service speed	18 miles per hour
Fuel oil capacity	15,000 gallons

Built entirely of steel, the hull is of fire - resistant construction throughout, in accordance with the latest rules and regulations of the Bureau of Marine Inspection and Navigation. Although the vessel was not classified, the specifications for all strength members of the hull were made equal to the rules of the American Bureau of Shipping.

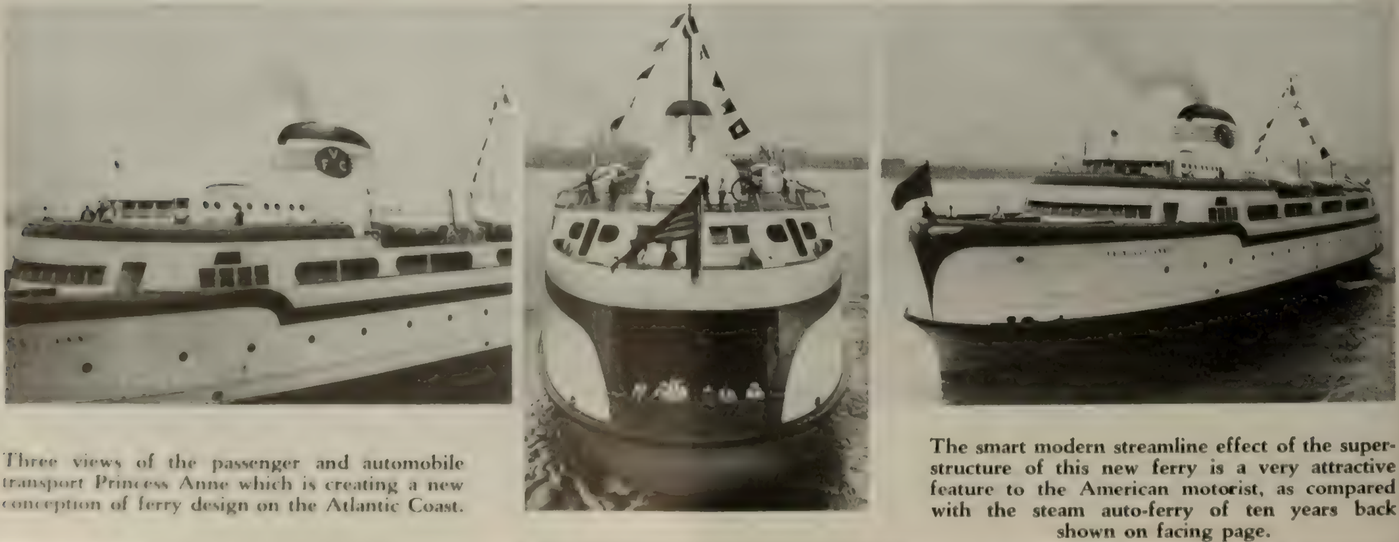
Her four decks are named boat, promenade, main, and lower. Below the main deck are ten watertight compartments.

The pilot house and the officers' quarters are on the boat deck in the streamlined erection forward of and forming a continuation of the stack cowling. Aft of the stack, this cowling encloses a fan room wherein are installed the Buffalo fans that move the air for ventilating the engine room, the boiler room, the passenger and crew accommodations, and the galleys. Ventilation and heating equipment was furnished by Carrier Brunswick International, Inc., and is designed to give a positive air circulation throughout the ship. In all living quarters and passenger accommodations, a complete change of air occurs every five minutes. In the galleys, the lunch counter, and the restaurant, the air changes every minute.

Four Welin lifeboats and six life rafts are carried. The boats are swung on Welin davits and are handled by the new Welin Machlachlan gravity type boat winch.

Passenger accommodations on the promenade deck are arranged with comfortable seating capacity for 400. A beautifully decorated and appointed dining room at the forward end of the house is glass enclosed, giving unobstructed view of the sea to diners seated at the small tables. Alcoves with tables are fitted at the sides of this room.

Forward of the house is an open deck space with comfortable seats. In addition to the dining room, the house on this deck is arranged to accommodate a purser's office; a women's rest room with maid's room, lounging space, and toilets; a men's rest room; a dance floor; and, at the after end, a section completely equipped for colored passengers, having its own open air deck. The furnish-



Three views of the passenger and automobile transport Princess Anne which is creating a new conception of ferry design on the Atlantic Coast.

The smart modern streamline effect of the superstructure of this new ferry is a very attractive feature to the American motorist, as compared with the steam auto-ferry of ten years back shown on facing page.

ings and equipment on this deck accentuate the "moderne" design.

The main or vehicle deck is completely covered with checkered steel plates to provide a non-skid surface. Large double water-tight doors, operated by a motor-driven rack and pinion, permit loading and discharging of automobiles at the bow. At the stern, the corresponding auto egress port is usually open, except for a waist-high bulwark of steel plate construction. However, this port also can be closed water-tight if necessary. Foot passengers embark through hinged side port doors on the starboard bow quarter opening at the foot of a stairway to the promenade deck.

At the after end of the lower deck, well equipped and comfortably furnished lounging rooms are arranged for truck drivers. In the same compartment on the starboard side, there are rooms for housing eight porters. Forward of this, on the lower deck, are the engine room, the boiler room, and the fuel oil tanks. Forward of the forward boiler room bulkhead are located the crew's mess room, the galley, and the quarters for unlicensed members of the crew.

One of the corridor lounges on the Princess Anne.

The hull of Princess Anne was built to the designs and under the supervision of W. R. Elsey, superintendent of floating equipment, Pennsylvania Railroad. For the streamlining of the superstructure, Raymond F. Loewy, consulting engineer of New York, was chiefly responsible. Of this streamlining, it should be noted that its only object was to produce a striking modernistic appearance in the contours of the superstructure. There was very little in saving of propulsion power to be gained by streamlining. At the service speed of 18 miles per hour, even when bucking a head wind that might be blowing 50 or 60 miles per hour, the relative speed of 60 to 70 miles per hour is not in the speed ranges at which streamlining counts heavily for economy of propulsion.

One of the most interesting features of this streamlined superstructure is the very neat job of butt welding the joints of the light steel plates that cover the frame work.

Propelling Machinery

Steam is generated in two Foster-Wheeler cross drum, sectional header, straight tube, marine type water tube boilers. The boilers are set across the beam with their furnace fronts facing, leaving a fore and aft fire room with ample width for tube removals.

Todd Combustion Equipment Corporation furnished the oil burning installation, consisting of Todd Model "C" oil burning air registers, Todd double coil type fuel oil heaters, and Dean Brothers horizontal duplex fuel oil service pumps, strainers, traps, and meter. Each boiler is equipped with five Diamond automatic-valved type soot blowers.

The boilers work at a pressure of 300 pounds per square inch and a temperature of 620 degrees Fahrenheit. Total heating surface is 7,652 square feet, with a total superheating surface of 742 square feet. Steam production under these conditions is 34,000 pounds per hour.

Steam from these boilers is supplied to two Skinner Unaflow double acting reciprocating engines, each directly connected through a Kingsbury thrust bearing to one of the twin propeller shafts. The stern tube on each shaft is fitted with a Goodrich Cutless Rubber bearing. Ferguson manganese bronze four-bladed propellers of 8 feet 6 inch diameter and 10 feet pitch are fitted, and these wheels at 200 revolutions a minute drove the hull on her trial at the rate of 18.76 miles per hour.

These engines are practically the

same as those on the Del-Mar-Va, which are giving such excellent economy on the same service. Each engine has four identical cylinders, 19-inch diameter by 20-inch stroke, and is rated 1,400 shaft horsepower at 200 revolutions a minute. The control is entirely by adjustment of the cut-off from two levers mounted on a stand at the center line of the ship on the engine room floor. This control gives maximum steam economies at all load, speed, or maneuvering conditions. The throttle is normally left wide open, even with the engine temporarily stopped. The perfectly steam-tight poppet valves and the absolute neutral of the valve gear permit full pressure in the chest without leakage.

A continuous forced feed automatic oil system insures proper lubrication of all bearings and all wiping surfaces. This system is served by two pumping units, each consisting of a Westinghouse 7½-horsepower induction motor driving two Schutte Koerting lubricating oil pumps, one at each end of the motor. Two Schutte Koerting lubricating oil coolers keep the lubricant at proper temperature, and a Sharples No. 12 Centrifuge of the En-bloc type, driven by a General Electric motor, keeps the oil purified.

Both engines exhaust through a common header into one Ingersoll-Rand two pass marine type condenser with a capacity for maintaining a 26-inch vacuum and condensing 35,000 pounds of steam per hour. Vacuum in the condenser is maintained by two single stage Ingersoll-Rand air ejectors mounted on after condensers of the one surface type. Each of these units is complete with steam strainer, throttle valve, air suction valve, and integral precooler.

For circulating the cooling water, the condenser is served by a Warren double suction single stage centrifugal pump driven through a speed reduction gear by a Westinghouse steam turbine, with a capacity of 4,000 gallons a minute.

Two Warren vertical simplex feed pumps 12 inches by 7 inches by 24 inches, each having a capacity for 76 gallons of feed water per minute against 350 pounds pressure, take care of water in the boilers. This feed water passes through a Davis improved Paracoil feed water heater with a capacity of raising 40,000 pounds of feed water per hour from 100 degrees to 230 degrees Fahrenheit.

Speaking tubes and Henschel engine room telegraphs connect the engine room with the pilot house and bridge. A Buffalo induced draft fan, capable of handling 30,000 cubic feet of gas per minute at 2 7/8-inch static pressure, and driven by a 20-horsepower Westinghouse induction motor, maintains the draft on the furnaces.

The electric auxiliary power, lighting, and cooking load is taken by two Westinghouse geared turbine 125-volt generating sets, each having a capacity of 75 kilowatts when supplied with steam at 275 pounds pressure and 200 degrees Fahrenheit superheat at the throttle, and exhausting against 10 pounds back pressure.

The water for drinking, cooking, and sanitary purposes is handled by Westco all bronze or bronze fitted motor driven pumps. Hot water is obtained through a Taco heater with capacity for heating 800 gallons per hour from 40 to 120 degrees Fahrenheit. A Permutit straight shell water softener and two Cochrane conical strainerless filters of the magnetic filtering material type keep the fresh water in good condition.

Two rudders are fitted at the stern, one in way of each propeller. These rudders are operated by one Lidgerwood special drum type, 5-inch by 6-inch steam steering gear. This steering gear gives great flexibility in maneuvering.

Altogether, the Princess Anne is a smooth, svelte model, easy to look at and of good propulsive efficiency. The vogue for streamlined ferries is now definitely established, with one on the Pacific and one on the Atlantic Coast.

Heat Insulation Sprayed on Like Paint

Insulation to conserve heat and cold has become a science. Once familiar chiefly as a covering for steam pipes, insulation has broadened its field of usefulness so rapidly in recent years that it occupies a highly important place in modern shipbuilding.

The newest development in this field is a revolutionary method of applying asbestos coating to practically any type of surface, large or small. Presented to the insulation trade by Keasbey & Mattison Company, this product is known as K. & M. Limpet Sprayed Asbestos.

Application is easy, with simple equipment. A training course, covering all phases of the work, can be completed in a week's time. Since a machine does the actual work of spraying, all the operator need do is direct it. Application is speedy, with the result that labor time is conserved.

Sealed asbestos insulation provid-

Applying Limpet sprayed asbestos to the underside of a steel deck.

ing complete coverage at any required thickness on any normal surface —metal, wood, cement, brick, or plaster—is readily applied. There is no cutting, fitting, or support of loose or blanket insulation materials. There are no joints, and regardless of shape, the surface is completely sealed. Even coverage is assured on angles, "I" beams, and projecting surfaces. Pebbled or smooth surface finishes are possible, either natural or colored, as well as surfaces designed for sound absorption or accoustical treatment. Hard surfaces are provided to withstand abnormal conditions, reinforced if necessary, in addition to waterproof surfaces to weather exposure. By virtue of the asbestos content, fire-resisting qualities are high. Sprayed asbestos is vermin-proof, and can be so surfaced that all danger of pocketing or trapping noxious gases is eliminated. The material is odorless in the presence of moisture.

One of the first shipbuilding companies to use this method of insulating and condensation connection was the Sun Shipbuilding and Dry Dock Company, Chester, Pennsylvania. Already the Gulf Refining Company tankers Gulfbelle and Gulfdawn have been launched, with underdecks and bulkheads insulated in this simple, highly efficient way. The Virginia Ferry Company's streamlined ferry boat, Princess Anne, has the entire stack uptake and stack house insulated in this way to add to the comfort of passengers in adjoining compartments.

Sprayed asbestos is recommended for general usage as insulation on turbines, stack uptakes, galleys, engine and auxiliary machine rooms, and underdecks and bulkheads (against condensation), for ice boxes and for similar applications. It performs a secondary function as a protective coating for steel, since it prevents corrosion by salt water. Its flexibility and elasticity are sufficient to withstand appreciable expansion and contraction of metal or other construction materials, as well as vibration or the shock of gunfire.

A highly important point is that it adheres to itself, so may be sprayed over if any portions are removed during repair or remodeling work. Its lightness in weight—6 to 8 ounces per square foot 1 inch thick—compares favorably with that of conventional methods of insulation. In figuring the cost of application, it is necessary to count only the weight of material, since no special preparation or supports are required.

Foam-Making Water Nozzle

An entirely new method, mechanical rather than chemical, of making foam for fighting flammable liquid fires, and suitable for use with long or short lines of ¾-inch to 2½-inch hose, has been announced by the Pyrene Manufacturing Company, Newark, New Jersey.

A water stream is converted into a continuous foam stream by coupling a unique patented nozzle, known as the Phomaire Play Pipe, to a water line supplying 75 pounds or more pressure at the play pipe. As the water passes through the play pipe, phomaide—a new foam-making solution carried by the operator in a hip pack, and air are automatically drawn into the water stream in the proper proportions to form foam. There are no complicated preliminaries, no confusing adjustments, no moving parts. Only one person is required at the play pipe.

Water may be pumped from suction, hydrant, or water tank. Only about 20 gallons of water per minute are required, making it practical wherever the water supply is limited, or for use with booster tank and booster pump.

One gallon of Phomaide Solution makes 350 gallons of foam. Foam production of 300 to 400 gallons per minute may be continued indefinitely by merely pouring additional solution into the hip pack.

In addition to the foam stream for fighting flammable liquid fires, a water stream for extinguishing any lingering fire in ordinary combustibles may be discharged by simply lifting the pickup tube out of the solution. When it is again dropped in the solution, a foam stream is produced.

The manufacturers claim that this entirely new low-cost foam tool, shown at private demonstrations, has already aroused unusual interest among industrial and municipal fire chiefs and safety officials who have flammable liquid hazards requiring speedy efficient foam protection.

Pacific International Trade

Culled from Recent Reports of U. S. Department of Commerce and Various Other Sources

● **Conditions in Pacific Basin**

Nearly all countries surrounding the Pacific Ocean basin continue to experience mixed conditions in the international trades, with, on the whole, a somewhat brighter picture than appeared at this season last year.

Panama Canal traffic is perhaps a good yardstick. During the fiscal year ending June 30, 1936, the big ditch handled a cargo volume of 26,505,943 tons, as compared with a tonnage of 25,309,527 the year before. This is an increase of 4.7 per cent. The breakdown of these figures shows some interesting facts. There were substantial decreases in two large and important items — mineral oils from California to the Atlantic Coast, and scrap metal from the Atlantic Coast to the Orient.

The effect of this was more than offset by sharp increases in Pacific-Atlantic movement of lumber from the Pacific Coast for the eastern seaboard and for Europe. The gain in lumber volume was 28 per cent. There was also a very substantial increase in the Atlantic-Pacific movement of manufactures of iron and steel. Ore shipments from Pacific to Atlantic totaled 1,496,021 tons, and Chilean nitrate exceeded 1,000,000 tons.

German imports of American foodstuffs continue to decline. Of the total foodstuffs imported by Germany from the United States in 1935, approximately 84 per cent were fruits. Much of this fruit (fresh, dried, and canned) went from the Pacific Coast. Exports of fresh apples to Germany declined 80 per cent in 1935 as compared with 1934. The present arrangements are all on a barter basis. Apples are on a 1 to 3

PACIFIC COAST FOREIGN TRADE

Month of June

Custom Districts	Exports		Imports	
	1936	1935	1936	1935
San Francisco	$8,049 598	$8,080,261	$6,881,762	$5,685,450
Los Angeles	7,501,851	7,652,695	4,895,044	3,410,440
San Diego	319,487	450 592	183,124	149,426
Total California	15,870 936	16,183,548	11,959,930	9,245,316
Oregon	1,176,214	646,799	666,134	852,522
Washington	5,742,586	2,525,325	2,760,425	2,483,037
Total Pacific Coast	22,789,736	19,355,672	15,386,489	12,580,875

SIX MONTHS ENDING JUNE

Custom Districts	Exports		Imports	
	1936	1935	1936	1935
San Francisco	$45,281,834	$44,859,787	$42,548,901	$37,761,913
Los Angeles	48,724,922	46,832,559	33,936,852	19,868,087
San Diego	2,169,744	2,380,505	1,574,225	1,191,871
Total California	96,176,500	94,072,851	78,059,978	58.821,871
Oregon	8,874,349	7.747,678	4,896,907	3,990,106
Washington	29,701,000	23,813,396	17,726,227	13,642,305
Total Pacific Coast	134 751,849	125,633,925	100,683,112	76,454,282

Preliminary figures—Subject to revision

Released by John J. Judge, District Manager, Bureau of Foreign and Domestic Commerce, 311 Custom House, San Francisco, California.

National Foreign Trade Convention

James A. Farrell, chairman of the National Foreign Trade Council, announces that the National Foreign Trade Convention for 1936 will be held at Chicago on November 18-20 inclusive.

In active cooperation with the Council in furthering the purposes of the Convention are the National Foreign Trade Association; Chicago Association of Commerce; Export Managers Club of Chicago; Chambers of Commerce in all principal cities; National Federation of Foreign Trade Associations; National Council of American Importers and Traders; American Exporters and Importers Association; Export Managers Club of New York; American-Chinese Trade Council; American-Japanese Trade Council; Joint Committee for Foreign Trade Action; Automobile Manufacturers Association; Foreign Credit Interchange Bureau of the National Association of Credit Men; Overseas Automotive Club; Inter-American Advisory Committee; American Steamship Owners' Association; Exporters-Importers Advisory Committee for the Export-Import Bank; and other foreign trade organizations.

Every important international trade country will send experts for conferences, and a splendid program of interesting papers has been arranged. The Chicago committee promises a record attendance.

A California steamer in the Oriental trade.

basis. Taken as a whole, the 1935 exports of American foodstuffs to Germany were only one-fifth of the 1933 total, and less than 5 per cent of the 1929 total.

In Great Britain, the employment situation is making progressive improvement, due mainly to the gradual resumption of normal conditions in the heavy industries. Great Britain is still our best foodstuffs customer.

Our reciprocal trade agreement with Canada allots an annual quota of 250,000,000 board feet of Douglas fir and western hemlock to enter the United States at a $2.00 duty and excise tax. Imports during the first six months totaled 75,227,965 board feet, or 30.1 per cent of the quota. Fifty-eight per cent of this total was Douglas fir.

● Orient Notes

Japan continues to hold the spotlight with her cut price export policy, but there are signs of distress among the exporters, and considerable discussion of government control of industry, finance, and foreign trade. We have long been hearing of foreign markets flooded with Japanese goods of all kinds—textiles in cotton, silk, rayon, and wool; cheap manufactured specialties of all sorts; and dried and canned fish. The latest specialty is likely to be the proverbial last straw that broke the camel's back. Japan is now canning sauerkraut at Yokohama, and during the last year shipped several thousand cases to Germany.

Of course, in this day of nationalistic self-sufficiency, tactics such as Japan is using bring reduced quotas, rising tariffs, and attempts at adverse bargaining agreements.

China's national government is beginning to show signs of fairly wide control in foreign trading policies. In connection with maintaining a quarantine against the boll weevil, it has designated Shanghai as the only port of entry for foreign cotton and cotton seed, since the Shanghai Bureau of Commodity Testing and Inspection is the only agency equipped to handle infected cottons. Progress is being made in forming a national tea production and distribution administration. The tung nut crop has already been nationalized by a decree dated May 12, 1936, which provides for the establishment of a semi-official corporation that will function as fiscal agent for China's vegetable oil industry and have complete control over processing of tung, perilla, and other vegetable oils. All Chinese tung oil merchants have expressed their willingness to turn over their plants to the new corporation—the capital has been fully subscribed—and unless some cog slipped, the monopoly should now be in full operation.

A Japanese steamer in the Pacific Coast trade.

The imports of China for the first half of 1936 totaled 459,000,000 yuan, a decline of 16 per cent, and the exports totaled 333,000,000, an increase of 38 per cent, as compared with the same period last year. The United States maintained her lead, supplying 17.8 per cent of the imports and taking 30.2 per cent of the exports.

Vegetable oils are the dominating feature of North China and Manchuria agriculture. The 1936 crop will greatly exceed that of 1935, including soy bean, sesame, peanut, cotton, rape, hemp, perilla, and linseed. The Manchurian government have started a five-year program for the increase of perilla seed crops. The present average production is around 100,000 tons. They hope to have 600,000 tons in 1941. Practically the entire crop is now milled in Japanese territory, and most of the oil is exported to the United States. Perilla seed oil to a total of 21,311,000 pounds came into the United States during June.

● **Philippines, British Malaya,** and **Netherland India** are all reacting to the steadier or rising prices on their natural products.

The Philippines had bumper crops of sugar and cocoanuts, and are doing a large export business in these two items. The gold mining output is setting new records and reached an all-time high in May.

The Philippine National Assembly is passing some bills interesting to foreign traders. One gives the president power to raise tariffs up to a maximum of 100 per cent above present rates, but not to reduce them. Another creates a 2,000,000-peso national importing and merchandising company. A third would create a

(Continued on Page 327)

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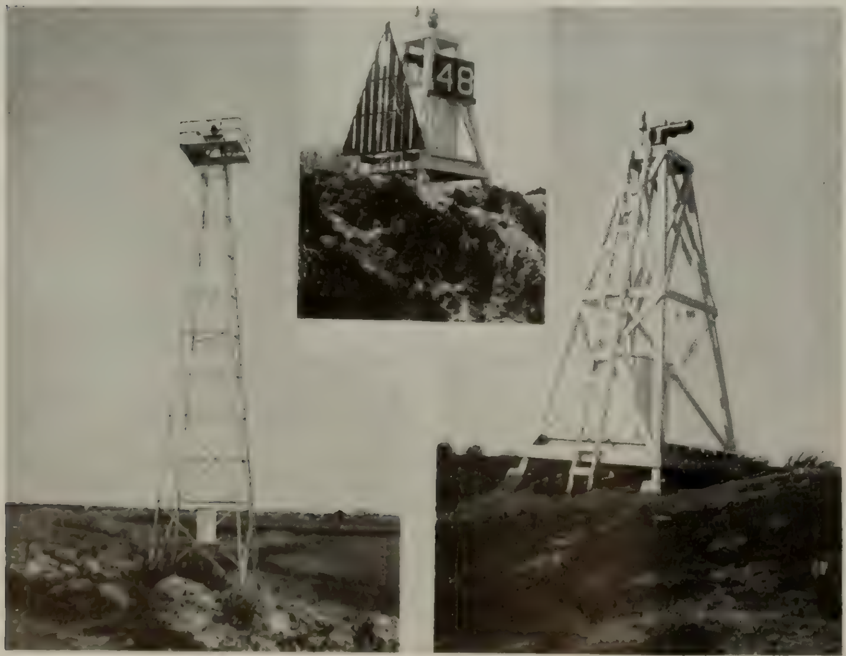
Electric primary batteries were used as the source of power for lighting the aids. For the channel markers, electric lamps equipped with motorized flasher mechanisms and lamp changers in 150-mm. fresnel lenses were installed. Flashing relays were used for control of the rear range beacons. The fixed and the flashing range beacons, as well as auxiliary range lights subsequently installed, are equipped with range lanterns having doublet lenses to concentrate the light beams along the range lines. Sun relays were installed at each location for automatically turning the lights on and off. When the sun sets, or if storms or fog cause darkness during the day, these sun relays automatically turn on the beacon lights. Otherwise the lights are turned off, thereby conserving the battery power.

The channel markers are located on each side of the channel. Those on the starboard, or right side, when approaching Stockton, display flashing red lights, while those on the opposite side are equipped with flashing green lights.

Two types of channel markers are used, viz., timber beacons and pile beacons, the names indicating the kind of structure supporting the mechanism and equipment. The height of these beacons ranges from sixteen to thirty-five feet. The timber supports consist of a square wood tower with a suitable battery box located near the ground. The pile supports are comprised of a cluster of four or more piles with the battery box located on a suitable platform about fifteen feet above water level. The front range beacons are similar in construction to the channel markers. At one or two locations, the front range light is located on the same structure as a channel marker light. Rear range beacons, however, are supported by steel towers from seventy-five to ninety feet in height and are located about two thousand feet in the rear of the front range beacons.

Some time after the original installation was completed, four additional beacons similar to the front range beacons were installed at the opposite ends of ranges one, two, three, and five. These auxiliary beacons display flashing white lights, while the front ranges burn continuously.

The original installation consisted of thirty-eight timber beacons and twelve pile beacons. Since then an



Three of the various types of markers and range lights used to indicate the Stockton deep water channel.

additional six beacons have been added. At each of the timber beacons, the power supply consists of twenty-two cells of primary battery connected in series and housed in a conveniently arranged box at the base of the tower. The electric flasher mechanism, with 150 mm. lens, equipped with electric lamp and the sun relay, are mounted on a platform at the top of the tower. The sun relays, which are connected to the lighting circuit only, have operated with a minimum of attention, and are so adjusted that the light flashes about sixty per cent of the time. The lamp changer in the flasher holds six separate 15-volt, .5 ampere bulbs, and the mechanism is so arranged that should one bulb fail the next one is automatically brought into focus. The flashing mechanism is driven by a small motor which runs continuously and requires but a few milliamperes of current for operation. The flashing characteristic is 0.5 seconds burning and 2.0 seconds dark.

The equipment of the pile beacons is identical with that used at the timber beacons, except that the primary battery cells have enameled steel jars instead of glass jars. Enameled steel jars were used in order to minimize breakage in case the pile foundation is jammed by passing craft. Since the original installation, a few instances of this nature have proved the practicality of the enameled steel jars.

The front range lights are located on either timber or pile structures, and are lighted from twelve cells of primary battery. On top of the timber or pile structure is located the sun relay and the range lens lantern. A 0.3-ampere, 3.5-volt lamp is used. This lamp displays a steady burning light controlled by the sun relay.

As stated above, the rear range beacons are located in the rear of the front ranges upon steel towers seventy-five to ninety feet in height. About fifteen feet above the ground, a platform supports a cabinet housing ten cells of primary battery and the flashing relay. Cells with enameled steel jars were used for these locations, on account of possible breakage when being handled around steel towers. On the tops of the towers are the range lens lanterns equipped with a 3.5 volt, .3 ampere lamp and the sun relay. The battery is so connected that eight cells are in series-multiple, i.e., two sets of four cells in series are connected in multiple. Two extra cells are connected in series with the two sets of four cells, making a six-cell circuit for operating the flashing relay. The sun relay is connected in series with the relay circuit.

The auxiliary beacons referred to above have the same equipment as the rear range beacons, except that they are located on timber structures similar to the channel markers.

Since the various types of beacons have been placed in service, they have operated with remarkable efficiency, very few interruptions having occurred. After the final adjustments were made and the light attendant became familiar with the various types of mechanism, the most frequent cause of failures has been malicious interference, the careless citizen with the rifle being the chief offender.

The battery life at the different types of beacons has been consistent with the original estimates. At the channel markers, the batteries have given an average life of about 350 to 360 days between renewals; at the front ranges, 510 to 515 days, and at the rear ranges, from 435 to 440 days. The auxiliary range lights have not been in service long enough to require renewals.

The fact that the actual battery renewals can be delayed for several days after their indicator panels show that the rated capacity has been delivered has saved attendants several tedious trips across irrigated fields in order to reach the rear ranges.

Plans for this system of aids to navigation were prepared in the office of the Superintendent of Lighthouses, San Francisco, California, headquarters of the 18th Lighthouse District, and the construction of towers and installation of equipment was carried out under his direction.

Thomas A. Edison, Inc., supplied the primary batteries for the channel lights and the range beacons, these being their type S-502 in glass jars and type S-507 in enameled steel jars. The sun relays also were furnished by Thomas A. Edison, Inc. The electric flashing mechanisms and lamp changers for all channel lights were supplied by Wallace and Tierman Company, the flashers being their type FA-31. General Railway Signal Company supplied the range lens lanterns, searchlight signal heads, and flashing relays for all range beacons.

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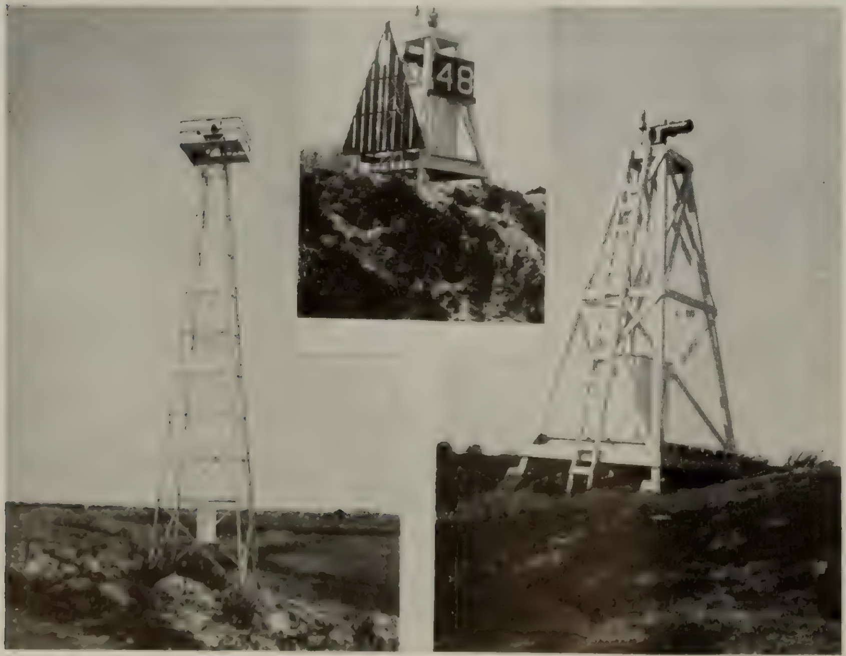

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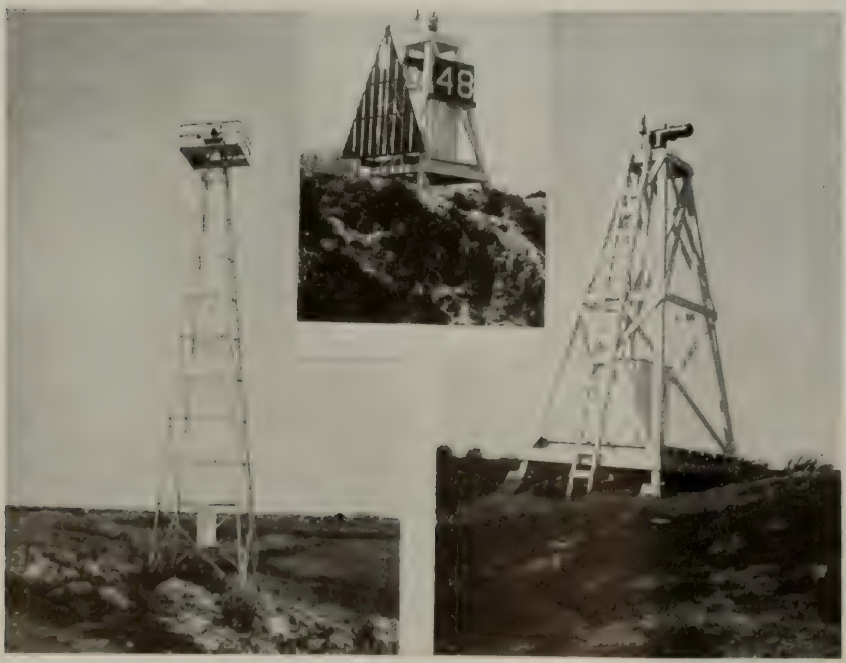


Three of the various types of markers and range lights used to indicate the Stockton deep water channel.

The channel markers are located on each side of the channel. Those on the starboard, or right side, when approaching Stockton, display flashing red lights, while those on the opposite side are equipped with flashing green lights.

Two types of channel markers are used, viz., timber beacons and pile beacons, the names indicating the kind of structure supporting the mechanism and equipment. The height of these beacons ranges from sixteen to thirty-five feet. The timber supports consist of a square wood tower with a suitable battery box located near the ground. The pile supports are comprised of a cluster of four or more piles with the battery box located on a suitable platform about fifteen feet above water level. The front range beacons are similar in construction to the channel markers. At one or two locations, the front range light is located on the same structure as a channel marker light. Rear range beacons, however, are supported by steel towers from seventy-five to ninety feet in height and are located about two thousand feet in the rear of the front range beacons.

Some time after the original installation was completed, four additional beacons similar to the front range beacons were installed at the opposite ends of ranges one, two, three, and five. These auxiliary beacons display flashing white lights, while the front ranges burn continuously.

The original installation consisted of thirty-eight timber beacons and twelve pile beacons. Since then an

additional six beacons have been added. At each of the timber beacons, the power supply consists of twenty-two cells of primary battery connected in series and housed in a conveniently arranged box at the base of the tower. The electric flasher mechanism, with 150 mm. lens, equipped with electric lamp and the sun relay, are mounted on a platform at the top of the tower. The sun relays, which are connected to the lighting circuit only, have operated with a minimum of attention, and are so adjusted that the light flashes about sixty per cent of the time. The lamp changer in the flasher holds six separate 15-volt, .5 ampere bulbs, and the mechanism is so arranged that should one bulb fail the next one is automatically brought into focus. The flashing mechanism is driven by a small motor which runs continuously and requires but a few milliamperes of current for operation. The flashing characteristic is 0.5 seconds burning and 2.0 seconds dark.

The equipment of the pile beacons is identical with that used at the timber beacons, except that the primary battery cells have enameled steel jars instead of glass jars. Enameled steel jars were used in order to minimize breakage in case the pile foundation is jammed by passing craft. Since the original installation, a few instances of this nature have proved the practicality of the enameled steel jars.

The front range lights are located on either timber or pile structures, and are lighted from twelve cells of primary battery. On top of the timber or pile structure is located the sun relay and the range lens lantern. A 0.3-ampere, 3.5-volt lamp is used. This lamp displays a steady burning light controlled by the sun relay.

As stated above, the rear range beacons are located in the rear of the front ranges upon steel towers seventy-five to ninety feet in height. About fifteen feet above the ground, a platform supports a cabinet housing ten cells of primary battery and the flashing relay. Cells with enameled steel jars were used for these locations, on account of possible breakage when being handled around steel towers. On the tops of the towers are the range lens lanterns equipped with a 3.5 volt, .3 ampere lamp and the sun relay. The battery is so connected that eight cells are in series-multiple, i.e., two sets of four cells in series are connected in multiple. Two extra cells are connected in series with the two sets of four cells, making a six-cell circuit for operating the flashing relay. The sun relay is connected in series with the relay circuit.

The auxiliary beacons referred to above have the same equipment as the rear range beacons, except that they are located on timber structures similar to the channel markers.

Since the various types of beacons have been placed in service, they have operated with remarkable efficiency, very few interruptions having occurred. After the final adjustments were made and the light attendant became familiar with the various types of mechanism, the most frequent cause of failures has been malicious interference, the careless citizen with the rifle being the chief offender.

The battery life at the different types of beacons has been consistent with the original estimates. At the channel markers, the batteries have given an average life of about 350 to 360 days between renewals; at the front ranges, 510 to 515 days, and at the rear ranges, from 435 to 440 days. The auxiliary range lights have not been in service long enough to require renewals.

The fact that the actual battery renewals can be delayed for several days after their indicator panels show that the rated capacity has been delivered has saved attendants several tedious trips across irrigated fields in order to reach the rear ranges.

Plans for this system of aids to navigation were prepared in the office of the Superintendent of Lighthouses, San Francisco, California, headquarters of the 18th Lighthouse District, and the construction of towers and installation of equipment was carried out under his direction.

Thomas A. Edison, Inc., supplied the primary batteries for the channel lights and the range beacons, these being their type S-502 in glass jars and type S-507 in enameled steel jars. The sun relays also were furnished by Thomas A. Edison, Inc. The electric flashing mechanisms and lamp changers for all channel lights were supplied by Wallace and Tierman Company, the flashers being their type FA-31. General Railway Signal Company supplied the range lens lanterns, searchlight signal heads, and flashing relays for all range beacons.

Book Review

Thermodynamics for Engineers, by the late Sir J. A. Ewing, 390 pages with numerous tables and diagrams, bound in green buckram with gold stampings; Cambridge, at the University Press; published in America by The Macmillan Company. Price $6.00 net.

Sir J. A. Ewing died on January 7, 1935, after having almost completed the revision of his famous textbook on thermodynamics, of which the first edition was brought out in 1920. He had asked Professor A. Egerton, of Oxford University, to finish the revision, and the result is this second edition which includes all of the advances made during the past fifteen years. Most interesting is the pedagogical plan of this authoritative volume as outlined in the preface to the first edition. Says Professor Ewing:

"In presenting the fundamental notions of thermodynamics, the writer has adopted a method which his experience as a teacher encourages him to think useful. The notions are first introduced in non-mathematical form; the reader is made familiar with them as physical realities and learns to apply them to practical problems; then, and not till then, he studies the mathematical relations between them. This method appears to have two advantages: it prevents the non-mathematical student from becoming bewildered on the threshold, and it saves the mathematical student from any risk of failing to realize the meaning of the symbols with which he plays."

In this second edition, while the content has been brought up to date, the original pedagogical notion has been preserved, and the result is an authoritative text arranged in a manner that makes the study of thermodynamics a progressive pleasure to any one interested in the application of heat energy to useful work.

Like many another university pedagogue, the learned author is occasionally somewhat mixed in his references to existing commercial heat engines, but none the less this book should be on the shelves of every marine engineer.

Mobile Radio Frequencies

A Statement of the Development and Present Status of Marine Radio by the American Steamship Owners' Association before the Hearing on Frequency Allocations before the Federal Communications Commission

Radio communication, in the early days, was solely a marine problem, and the present development of this service represents an experience of over thirty years. This pioneer work, in the early stages, had the whole frequency spectrum for its research and investigation. The fundamental principles of radio propagation were all that was known. The simple relation of the distance between masts aboard a ship practically controlled the length of the antenna, and this, in turn, determined the wave length.

In 1903, the entire band was utilized from zero to approximately 1,000 kilocycles, and during the first radio convention, held in Berlin in 1906, specific channels were recognized as international mobile allocations, 500 kilocycles being set aside for distress communications, and 1,000 kilocycles for a working channel or frequency. Subsequent development of mobile services for mobile interests virtually centered around the frequencies most effective for distress, direction finder, and traffic frequencies, which could be used with the same transmitter and with the same antenna, within the limitations aboard ship, by means of one operator and one receiver.

These allocations were again recognized at the London Radio Convention in 1912, and it was not until the advent of the arc transmitter in 1915 that part of the radio spectrum was allocated for fixed or point-to-point services, namely 100 to 200 kilocycles. With the advent of vacuum tube transmission in 1921, more and more vessels were equipped with radio. Frequency allocations became a problem, due to other services employing radio at that time; but it was not until 1925, with the advent of high frequency or short wave transmission, and also the introduction of radio broadcasting, that the frequency allocations for mobile use became a major problem, and the so-called intermediate bands of frequencies, around 500 kilocycles, were reduced to a narrow band between approximately 250 and 550 kilocycles, 500 kilocycles, however, remaining as the distress or calling frequency.

At the Washington Convention in 1927, definite world-wide allocations were made applicable to all services, and bands were definitely established for each particular service, the mobile low frequency telegraph bands being 110 to 160. In the so-called intermediate frequency band, mobile stations open to general public correspondence were allocated between 285 and 515 kilocycles, of which 285 to 315 were reserved for radiobeacon service, 315 to 360 for mobile service not open to public correspondence, 360 to 390 radio direction finding (375 the carrier frequency, with a 15 kilocycle guard band on each side), 390 to 485 allocated for ship telegraph service, and 485 to 515 for distress (500 kilocycles being the carrier frequency used for such service, with a 15 kilocycle guard band on each side). In reality, from these allocations, the intermediate frequency band for commercial purposes is but 95 kilocycles, namely 390 to 515, 30 kilcycles of which is reserved for the guard band around 500 kilocycles. In this narrow band of 95 kilocycles, 15,000 merchant vessels of the world meet to exchange correspondence between ship and shore, shore and ship, and ship and ship.

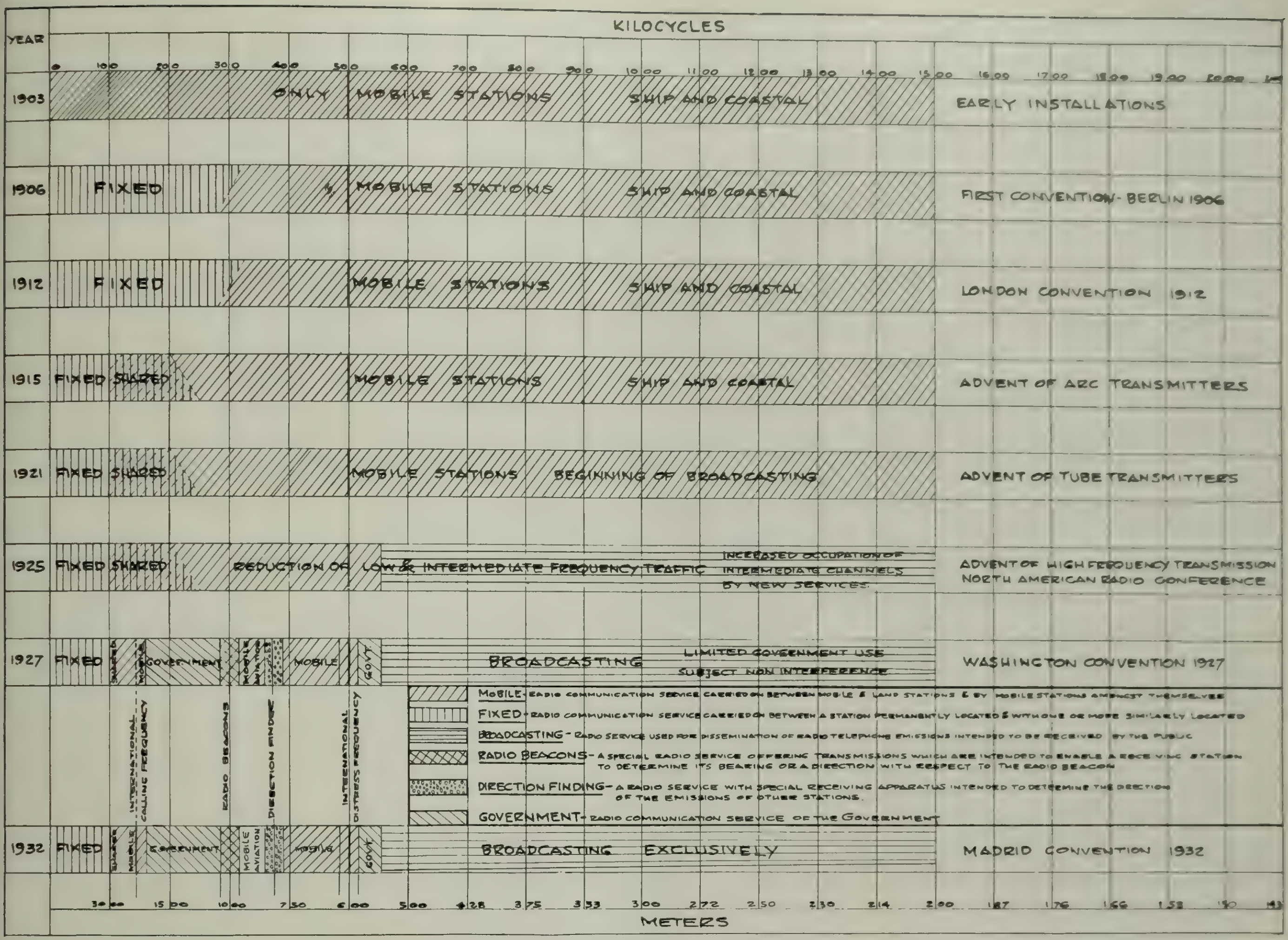
The United States delegation at the Madrid Convention in 1932 recognized the importance of the Washington 1927 Convention allocation, as no change applicable to the North American continent was made in the

RADIO EQUIPPED VESSELS OF THE WORLD

(Berne List - March 1936)

Country	Type A	Type B	Total A - B	Per cent of A to Total	Per cent of B to Total	Per cent of A to Total of World	Per cent of B to Total of World
United States	1,541	754	2,295	67.14	32.86	10.03	4.91
Germany	345	644	989	34.88	65.12	2.25	4.19
Finland	120	52	172	69.77	30.23	.78	.34
Holland	187	327	514	36.38	63.62	1.22	2.13
Norway	329	623	952	34.56	65.44	2.14	4.05
Denmark	216	198	414	52.17	47.83	1.40	1.29
Great Britain	1,359	2,261	3,620	37.54	62.46	8.84	14.72
Sweden	193	112	305	63.28	36.72	1.26	.73
Italy	124	393	517	23.98	76.02	.81	2.56
France	353	553	906	38.96	61.04	2.30	3.60
Chile	59	-	59	100.00	-	.38	-
Australia	42	95	137	30.66	69.34	.27	.62
Russia	471	85	556	84.71	15.29	3.07	.55
Spain	50	310	360	13.89	86.11	.32	2.02
Canada	168	94	262	64.12	35.88	1.09	.61
Greece	34	415	449	7.57	92.43	.22	2.70
Danzig	2	3	5	40.00	60.00	.01	.02
Turkey	2	43	45	4.44	95.56	.01	.28
Curacao	3	32	35	8.57	91.43	.02	.21
Japan	709	719	1,428	49.65	50.35	4.61	4.68
Portugal	7	52	59	11.86	88.14	.05	.34
Panama	47	12	59	79.66	20.34	.30	.08
Brazil	3	131	134	2.24	97.76	.02	.85
South Africa	41	8	49	83.67	16.33	.27	.05
Iceland	19	32	51	37.25	62.75	.12	.21
Hongkong	19	58	77	24.68	75.32	.12	.38
British India	13	36	49	26.53	73.47	.09	.23
Roumania	3	18	21	14.29	85.71	.02	.12
Belgium	142	73	215	66.05	33.95	.92	.48
Honduras	16	-	16	100.00	-	.104	-
Yugoslavia	2	66	68	2.94	97.06	.01	.43
New Zealand	25	34	59	42.37	57.63	.16	.22
Argentina	85	28	113	75.22	24.78	.55	.18
Peru	-	8	8	-	100.00	-	.05
Latvia	8	52	60	13.33	86.67	.05	.34
Egypt	3	20	23	13.04	86.96	.02	.13
China	97	29	126	76.98	23.02	.63	.19
Uruguay	4	9	13	30.77	69.23	.03	.06
Ireland	11	18	29	37.93	62.07	.07	.12
Bulgaria	-	5	5	-	100.00	-	.03
Newfoundland	9	18	27	33.33	66.67	.06	.12
Cuba	3	-	3	100.00	-	.02	-
Poland	6	17	23	26.09	73.91	.04	.11
Mexico	10	2	12	83.33	16.67	.07	.01
Esthonia	4	33	37	10.81	89.19	.03	.21
Surinam	2	-	2	100.00	-	.01	-
Morocco	1	-	1	100.00	-	.006	-
Dominican Rep.	1	-	1	100.00	-	.006	-
Nicaragua	5	-	5	100.00	-	.03	-
	6,893	8,472	15,365	44.86	55.14		

Total and World



Graph showing evolution of allocation of frequency bands to various radio services.

low frequency and intermediate frequency bands just outlined.

The chart herewith shows radio allocations in the low and intermediate frequency bands from the year 1903 through the Madrid Convention of 1932, applicable to the North American region. Note that the blocks on this chart representing mobile allocations for the maritime services open to public correspondence, have diminished to a point in the radio spectrum to a few channels affording radio communication between ship and shore, shore and ship, and ship and ship.

In 1929, a Safety of Life at Sea Convention, held in London, recognized the extended use radio has for ship communication, and compelled the installation and use of radio apparatus aboard ocean-going vessels of the world. The results of this convention caused hundreds of vessels to become radio equipped, and in the United States we hope in the near future to have many more vessels added to this list. Fortunately, our Senate has ratified this Safety of Life at Sea Convention, and there is legislation now passed whereby many vessels in the United States that are not radio equipped now will be so equipped in the near future.

Today, on account of depressed conditions in world shipping, mobile traffic is far from normal, and when we consider the number of additional vessels that must be equipped with radio under the Safety of Life at Sea Convention and similar legislation, it is not unreasonable to estimate that mobile traffic is only about one-half what normally may be expected, to say nothing of progressive increases in the number of installations. However, as it is, interference is bad in the mobile services, but we look forward to some relief as spark transmissions diminish.

● U. S. Leads in Marine Radio

In this connection, as to the elimination of spark apparatus, the American Merchant Marine gave up much in 1927 when they agreed to the abolition date of all spark apparatus as of January 1, 1940. The table reproduced herewith shows the various merchant vessels of the world, radio equipped, employing Type A (tube) and Type B (spark) emission. From the latest Berne list of March, 1936, there are 15,365 merchant vessels radio equipped. Of this number 6,893 employ Type A emission and 8,472 employ Type B, or 44.86 per cent Type A and 55.14 per cent Type B. Of this number, the United States has a total of 2,295 vessels radio equipped, 1,541 of Type A and 754 of Type B, or 67.14 per cent A and 32.86 per cent B.

This equipment on the vessels of the merchant fleet of the United States gives that fleet 10.03 per cent of all the Type A installations on the world's total fleets, employing Type A and 4.91 per cent Type B, which is the highest Type A per cent of any merchant marine in the world, and indicates the forward steps the

American shipowner has already taken to modernize ship radio telegraph apparatus.

Because of the great congestion on the spark frequencies, ships equipped with A1 and A2 emissions, which usually handle the greater traffic volume, must use other frequencies so as to secure proper communication.

In addition to the 15,000-odd vessels utilizing this intermediate frequency band there are, of course, a great number of radio coast stations throughout the world that must be accommodated within this band in order to effect communications between ship and shore and shore and ship.

Ships that, during the course of their voyages, are naturally in motion, must maintain communication under all conditions. If a number of vessels must operate simultaneously, particularly in congested areas, a sufficient number of communication channels, adequately separated, must be available.

At the Madrid Convention, 1932, the following high frequency bands were allocated exclusively to the mobile service for use by ships' stations carrying on commercial communications:

5500 to 5550
6170 to 6250
8230 to 8330
11000 to 11100
12340 to 12500
16460 to 16660
22000 to 22200 kilocycles

High frequency or short wave communication in the mobile ship telegraph service is fast becoming a necessity for long range communication. Many installations have taken place within the past five years, and we anticipate many more in these bands.

High frequency transmission is highly desirable aboard vessels when they are off the so-called beaten tracks of the world, and also aboard heavy communication traffic vessels (large passenger vessels), since this latter service helps to relieve communication traffic congestion in the intermediate frequency band. It is, therefore, desirable that this type of communication be expanded to its fullest extent.

Frequencies above 30,000 kilocycles or below 10 meters are not at present allocated for use in the maritime mobile service, but it is desirable that channels be reserved in the 30 megacycle band for future use aboard ships. Present-day transmitters and receivers below 10 meters have not proved very efficient for use over long distances, but improvement in the future will, no doubt, be made in this connection. It is our understanding that there are in use several 5-meter radio telephone installations on the San Francisco-Oakland Bay bridge, now under construction, and also on the tugs and tenders working on that job. From information we have received, these radio telephone sets have proved very satisfactory. In this connection, it may be well to point out the desirability of having channels reserved in the 30 megacycle band for short distance radio telephone communication, which could be effectively used on harbor craft in various ports of the United States.

● Two Modest Requests

There is one request we should like to make, insofar as expanding one band of frequencies is concerned. This is the radiobeacon band that is internationally allocated 285 to 315 kilocycles, only 30 kilocycles in width. In the United States, due to a 1-kilocycle guard band on each side, this is but 28 kilocycles in width. We believe that this narrow band of frequencies is not sufficient to accommodate the radiobeacon service of the world, especially in the United States, and we would suggest that some means be employed whereby this band may be broadened sufficiently to accommodate future installations. We cannot suggest a means for this expansion, as we believe this should be left to the good engineering practice of the Commission.

There are certain types of service in the world that cannot be effected in any other manner than by the means of radio communication. Among these are ships at sea, aircraft, and trains. Also, there are certain services, auxiliary to radio communications, that can be accomplished only by radio, such as navigational aids, weather, ice reports, radiobeacon, and radio direction finding services. Radio communication is the very life of maritime commerce and of our nation. One million, seven hundred thousand of the American public, yearly traveling by ship on the high seas, are entirely dependent upon radio for their business and personal communications. The lives of this traveling public are protected at all times by means of the science of radio. As indicated on Chart I, all mobile services, such as aircraft, Government, and merchant services, have been allocated, so as to be adjacent to each other. This is important for the preservation of safety of life at sea and in the air, since the grouping of these services as allocated makes the tuning of a receiver very simple.

Therefore, we respectfully request that no change be made to the present allocation of radio telegraph frequencies applicable to the maritime mobile services in the low, intermediate, and high frequency bands.

Trade Literature

Data Book 403: An attractive 25-page booklet published by the Republic Flow Meters Co., describing the latest developments in the measurement of CO_2 as incorporated in a new design of CO_2 meter.

Experience gained in hundreds of plants over a period of many years has been utilized in building this improved analyzer. The percent of CO_2 in the flue gas is measured by the Orsat method, which is the accepted standard for industrial practice, and the meter is built to duplicate mechanically this chemical analysis. The meter is driven by a fractional horsepower electric motor and requires no water for its operation. There is no possibility of stoppage in the gas line, as the instrument has a suction capable of drawing fourteen inches of mercury. The large caustic tank holds enough potash to last from four to six months. Temperature variations have no effect on the meter readings. A filter in the gas line removes all CO_2 from the flue gas before it reaches the analyzer.

A permanent, continuous, pen line record is inscribed, which may be read directly in percent CO_2, and arrangements of indicators and recorders may be made to fit any requirement. Related factors, such as steam flow, temperature, draft, and pressure may be combined on one circular chart. The entire meter is ruggedly constructed with a minimum of moving parts, assuring years of satisfactory service under the most severe boiler room conditions.

Marine Turbine Progress

Some Developments in the Design of Important Details in the Westinghouse Turbine

In considering the development of marine propulsion equipment by the Westinghouse Electric and Manufacturing Company during the twenty-seven years the company has devoted to the production of marine machinery, it is interesting to note that while a greater number of units have been fitted to merchant ships for the Atlantic Coast, the largest and most important installations are on Pacific Coast ships. Commencing with the 10,000 S.H.P. twin screw machinery installed on the Matson liner Maui in 1916, Westinghouse machinery was used on the Matson cargo steamers Manulani and Manukai in 1925; on the Inter-Island passenger and cargo steamers Waialele, Humuula, and Hualalai, in 1928; and on the Dollar passenger cargo liner President Coolidge, which has twin screw electric drive machinery of 26,500 horsepower, in 1931.

Judged by the criterion that should carry the greatest weight in the consideration of marine machinery, that is, reliability, these installations have been singularly successful. However, twenty years have passed since the Maui sailed on her maiden voyage, and marine engineering has made much worth-while progress in that time. Steam pressures and temperatures have reached a point where they become the subject of vigorous debate wherever marine engineers meet, to the ultimate good of our shipping industry.

Improved methods of construction, such as arc welding, have opened a new field to the designing engineer. Condensing apparatus, pumps, and turbo-generating equipment, have kept pace with the general advance, until today the marine engineer can visualize a set of steam machinery possessing the ultimate in efficiency and reliability.

While the contemplation of this picture, in a general sense, is satisfactory, we should not lose sight of the fact that the reliability of any machinery depends almost entirely on the excellence of the design, workmanship, and materials, of the vital details.

Of these details, it is safe to say that the marine engineer thinks first of turbine blading. Is it now stiffened to the degree necessary to avoid failure, due to vibration? Will an unintentional slug of water from the boilers cause any damage? Is it fastened into rotor and cylinder so that the most severe handling under emergency conditions will leave it still secure? Can a blade rub occur that will cause a blade failure? These are vital details to a ship operator. Consequently, we believe that a description of the latest type of blading used on Westinghouse turbines will be of real interest to marine engineers.

Their marine steam turbine standard blading is now made from a low carbon corrosion resisting steel. The impulse blades and the larger of the straight reaction blades are machined from bar stock. The smaller reaction blades are made from a rolled and drawn section, while the large, warped, low pressure blades designed for maximum efficiency in the larger units are made from drop forgings, the base being machined and the body ground all over to an accurate gauge fit.

Figure 1 shows a view of the impulse blades in which can be seen the method used to retain them in the cylinder and rotor, and Fig. 2 illus-

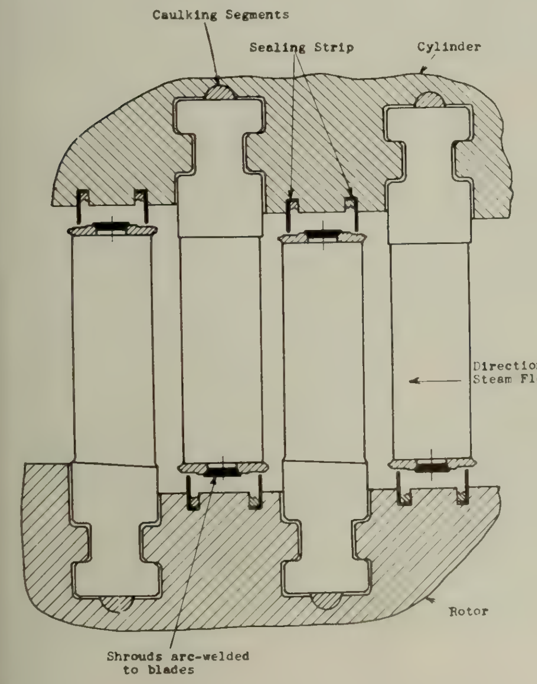
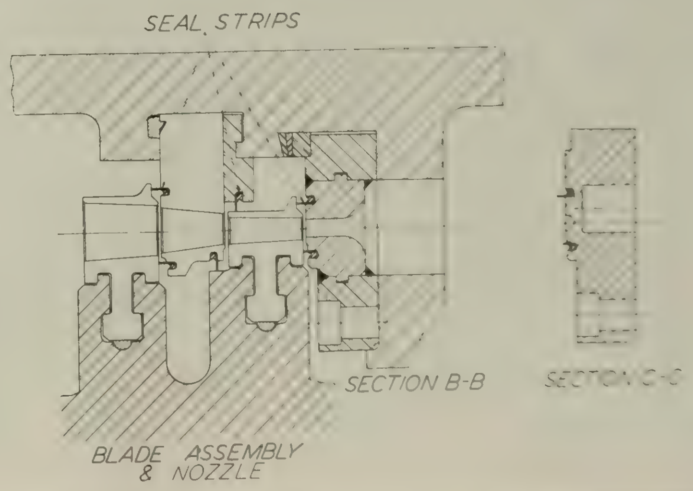


Fig. 1 at left.

Fig. 2 below.



trates the reaction blading with radial seal strips.

These steel blades are made in a shop specially designed and equipped for blade work, so that blades of the same section are completely interchangeable. They are tested in a laboratory set aside for blade research work, and this permits the development of blade shapes that are the most efficient for the service required. Furthermore, the accurate vibration tests conducted in this same blade laboratory enable the determination of the position of lashing wires where necessary to insure freedom from fatigue failures of the blades due to vibration.

The tip leakage of reaction blades has an important bearing on the efficiency of the turbine, particularly in the high pressure element. For many years the usual procedure was to "thin tip" these reaction blades, with the thought in mind that in the event of an unusual distortion of the cylinder, causing a blade rub, the blades would not be seriously damaged, as the contact between the blade and cylinder would result merely in wearing off some of the thin outer edge. However, it was found that an unusually hard rub would sometimes cause considerable damage.

Recognizing the fact that an emergency starting of the main turbines when cold often results in a temporary distortion of the turbine cylinder, a design of radial seal was developed that can withstand heavy rubs without damaging the blades. This is shown in Fig. 2. As will be seen, the ends of the blades are shrouded, the shroud being a corrosion resisting steel strip welded to the blades.

Before adopting this construction, complete tests were made not only in the laboratory but on the turbine test floor and in the metallurgical department. The construction proved thoroughly reliable. Subsequent service reports, covering the operation of the machines for the past three years, have confirmed these experimental findings. The shroud strip not only results in effectively stiffening the blades against vibration without the use of lashing wires in the smaller blades, but it also permits the outer periphery to be turned in the lathe, and thus presents a true diameter to the thin rolled and drawn corrosion resisting steel strips forming the radial seals. These strips are likewise bored to a definite diameter.

Doubtless the first thought that will occur is the possibility of damage to the seal strips in case of a blade rub. Here again, both experiment and field service have demonstrated that this form of radial blade tip sealing is thoroughly reliable. The Westinghouse Company have adopted it as standard for all of their high temperature and high pressure work, both land and marine.

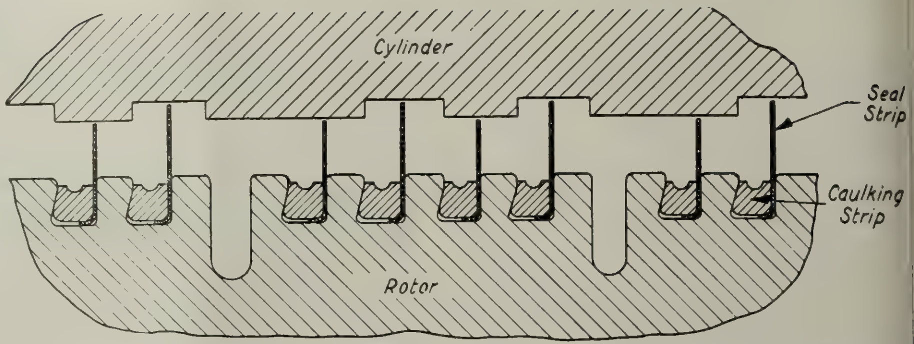
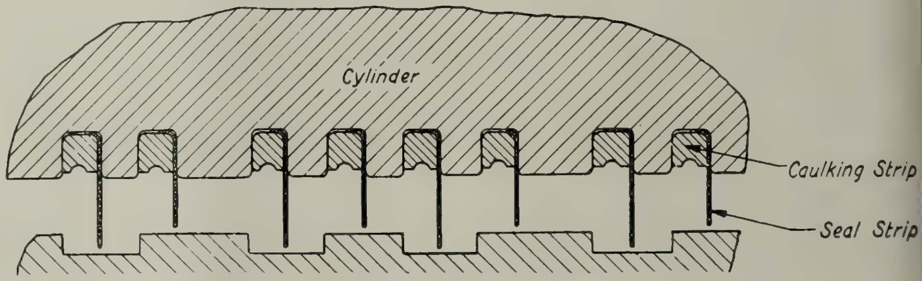


Fig. **3.**



Matson passenger and cargo liner Maui. Twin Screw, 10,000 shaft horsepower, Westinghouse geared turbines installed 1916.

Interisland Steamer Hualalai. Westinghouse geared turbines installed 1928.

This same type of seal strip illustrated by Fig. 3 is used also for the dummy or balance piston. The strips are held in position by soft iron caulking pieces rolled into the seal strip grooves in either the rotor or the cylinder.

This development of blading and labyrinth seals, which, as stated above, contains items of vital interest to the operator, is merely typical of the research and development conducted on other mechanical details as well, such as steam admission valves, control mechanism, and cylinders.

As a result, the Westinghouse Company faces the future with assurance that it is in a position to meet any demand for modern marine machinery, and the shipping world will undoubtedly see further advances which may even overshadow those of the past twenty-five years.

New Anti-Friction Plastic Packing

A general, all-service plastic packing with a new anti-frictional, dry-graphite lubrication, is announced by the Crane Packing Company. Exhaustive tests have shown that this new product, which bears the trade name Super-Seal, provides a permanent anti-frictional packing. It is resilient, and there is no tendency to harden or dry out. It flows readily under gland pressure, which makes it very easy to adapt to smaller or larger packing spaces.

Super-Seal is composed basically of extremely fine particles of a new alloy, which rewarded years of research, experimentation, and testing. The special high temperature binder completely covers and saturates each particle of alloy and each strand of long fibre asbestos, and contains the purest flake graphite, processed for even distribution and resistance to high temperatures, thus giving assurance that while there is any packing in the box, there is perfect dry-graphite lubrication at the wearing face of the packing. This is the first plastic packing to be put up in spiral form.

Super-Seal is engineered for all-around packing service in power plants, refineries, chemical plants, the process industries, paper mills, marine service, and industrial works of all kinds. For widest application and ease of handling, it is put up in six convenient forms: Valve Stem (round); Spiral Form (rectangular); Coil Form (square); Bulk Form (for emergency use); Ring Form (split); and Production Sets (endless).

It is available in six styles for special services: No. 1, for general service—air, water, steam, ammonia, mild chemicals, etc., where temperatures do not exceed 600 degrees Fahrenheit; No. 2, for superheated steam, hot oils, and gases, where temperatures run 600 degrees Fahrenheit and above; No. 3, for oils, petroleum distillates, and solvents, where temperatures do not exceed 600 degrees Fahrenheit; No. 4, non-metallic, for foods, fruit juices, edibles, etc.; No. 5, non-metallic, for chemicals, caustic alkali, and acids; and No. 6, non-metallic, for extremely high temperatures—steam or gases.

It is worthy of note that this packing can be obtained in the form, style, and exact size to fit the job. Valve stem, round, comes in sizes 3-16 inch, ¼ inch, and 5-16 inch; Spiral Form, rectangular, in steps of 1-16 inch from ¼ inch to 1¼ inch inclusive; and Coil Form, square, in eleven sizes from 3-8 inch to 1 inch.

Complete information and literature, with details to specific applications, can be had by directing inquiries to this publication or to the manufacturer.

Seattle Shipping Briefs

S.S. Santa Olivia, of Libby, McNeill and Libby, arriving at Seattle with 125,000 cases of red salmon and 575 cannery workers and fishermen.

● Tourists and Salmon.

Seattle is experiencing the greatest Alaska traffic in the history of the port, all records for passengers and cargo carried being broken. Not only has the tourist season been unprecedented, but the lines operating in the Seattle-Alaska routes have been swamped by the movement of canned salmon from the Alaska canneries.

The Alaska Steamship Company has been operating twenty vessels manned by a total of approximately 1,300 seafaring men, in its efforts to handle the huge business offering. The fleet includes the big transpacific freighter Olympia of the Tacoma Oriental Line, chartered for a voyage to southeastern Alaska canneries, and the steamship Sacramento, from the Nelson Line. The Olympia, a vessel of 10,275 deadweight tons, will bring the largest cargo of canned salmon ever shipped out of Alaska, between 250,000 and 300,000 cases.

Three ships of the fleet of Libby, McNeill & Libby, arriving in Seattle recently from Bristol Bay, Alaska, brought cargoes of red salmon totaling 3,750,000 cases, valued at more than $3,000,000.

It is estimated that Alaska's 1936 salmon pack will total between 6,000,000 and 6,500,000 cases, valued at approximately $40 000,000, one of the largest in the history of the industry. A report from the Prince William Sound area said the salmon run was so heavy that cannery operators asked seiners to stop fishing.

● Fish Boats Building.

Work on two seine boats for the Nakat Packing Corporation is progressing at the plant of the Maritime Shipyards, Inc., a new ship construction plant on the south side of Shilshole Bay, and they will be launched the latter part of September. The vessels are 47 feet long, 14 feet beam, and 6 feet draft. They will be equipped with Hall-Scott 60-70-horsepower gasoline engines. The craft will be operated in Alaskan waters.

The Maritime Shipyards has a modern ship construction plant, with space in building sheds for from eight to ten vessels. There are overhead cranes and other equipment. Materials for eight vessels are now in storage under cover. The two vessels now under construction were designed by H. C. Hanson, Seattle naval architect.

Aerial view of Smith's Core Terminals, Port of Seattle, the largest commercial docks in the world.

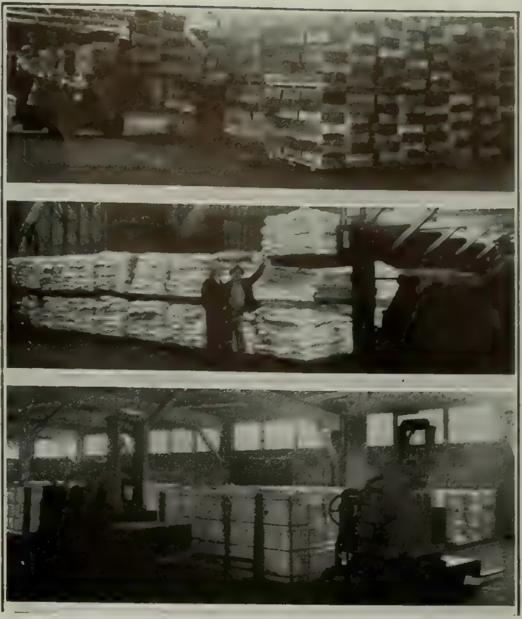
● International Seal Skins.

With a cargo of 52,000 seal skins, valued at approximately $2,000,000, the United States navy transport Vega, skippered by Commander C. W. Flynn, arrived in Seattle on August 19 from the Pribilof Islands of Bering Sea. The skins were divided among the governments of the United States, Great Britain, and Japan, in accordance with the international sealing treaty.

Uncle Sam's share of the "take" was shipped to St. Louis, where the Fouke Fur Company will process the skins and sell them at auction, acting for the government.

Great Britain's part was shipped to London via Vancouver, B.C., and Montreal.

Japan's skins were sent to St.



Seattle piers are equipped with modern cargo handling devices. Here we show examples of skid load handling by Elwell Parker electric trucks. Top to Bottom: piling shingles at Spokane Street Dock; picking up flour, American Hawaiian Dock; and handling bundled paper.

Louis, where they will be processed and sold at auction, and the proceeds forwarded by check to the Japanese government.

● Fresh Fruit Exports.

Sixteen services, operating carriers under the flags of nine nations have scheduled refrigerator vessels for Seattle calls during the annual fresh fruit movement from the Pacific Northwest to various parts of the world. Twenty of the vessels will berth in September, and twenty-one in October. They will load apples and pears for the United Kingdom and the Continent. A total of twenty-eight ports of discharge are listed for the fleet. Twenty-four sailings of refrigerator ships in the joint service of the North German Lloyd and Hamburg-American Line from Seattle to Europe have been scheduled for the season.

Five ships of the North German Lloyd, the Weser, Elbe, Schwaben, Este, and Leuna, and six carriers of the Hamburg-American Line, the Vancouver, Oakland, Seattle, Tacoma, Portland, and Stassfurt, will take part in the movement. The Leuna and Stassfurt will make one voyage each in the service. A ten-day schedule will be maintained by the fleet, sailings starting on September 11 and continuing into next May.

● An Unusual Tow.

The diesel tugs Triumph and Maurine, of the Washington Tug & Barge Company, recently completed an unusual tow—delivery of equipment of the General Construction Company of Seattle to La Connor for use in dredging Swinomish Slough. This equipment consisted of the dredge Missouri, three scows, more than 100 pontoons with pipeline and a small tug bringing up the rear. Swinomish Slough will be dredged to a depth of 12 feet at low water for a width of 100 feet. This work will provide a 12-mile sheltered passage for small craft from Saratoga Passage to Padilla Bay and eliminate the use of Deception Pass, which is dangerous because of tidal rapids.

With the distinction of being the only steel ship built in a privately owned shipyard in the Pacific Northwest in several years, the $250,000 motor vessel Robert Gray, named for the discoverer of the Columbia River, has been completed at the plant of the Lake Washington Shipyards. The Robert Gray was built for the Engineers Corps, United States Army, and will be operated in the Columbia River district. The vessel was launched 99 per cent complete. Mrs. Milo P. Fox, wife of Colonel Fox, United States district engineer at Portland, was the sponsor. A description and picture of this vessel will be found in the Portland Notes in this issue.

● Port Personals.

Captain William Fisher, of San Francisco, supervising inspector, Bureau of Marine Inspection and Navigation, was in Seattle recently conferring with Jesse E. Murry, assistant supervising inspector for the service. Captain Fisher is in charge of the recently merged Washington-Alaska and California-Oregon-Hawaii districts.

Captain F. E. Lovejoy, chief executive of Puget Sound Freight Lines Inc., and president of the Propeller Club of Seattle, is a Republican candidate for State Legislator in Washington's 34th district, West Seattle.

Col. W. C. Bickford, general manager and chief engineer, Port of Seattle Commission, announces that the Commission has decided to resume operation of its huge Hanford Street terminal and grain elevator. For several years past, this terminal has been under lease to the Continental Grain Corporation. As secretary-treasurer of the Pacific Coast Association of Port Authorities, Colonel Bickford is very busy getting ready for the 23rd annual convention of that body, which meets in Hotel Olympic, Seattle, on September 3, 4, and 5.

Spokane Street Terminal, Seattle, showing cold storage in background.

Port of Portland Notes

● River Traffic.

The 1936 summer season has been one of considerable activity on the Columbia River, where both freight and passenger river services took on a new lease of life. Bonneville Dam construction was the motivating force, both direct and indirect, behind most of this activity.

Inland Navigation Company, a Seattle corporation formed to build and operate river craft on the Columbia, announced that construction had been started on a $200,000, 190-foot, all steel, twin screw, 1200-horsepower diesel boat of modern design which it proposed to operate between Portland and the head of navigation, The Dalles at present, and Umatilla in the future. Jack L. Hyneman, general manager of the company, declares that this boat will be ready in November.

Harkins Transportation, operating the Georgiana and L. P. Hosford between Portland and Astoria, moved its Portland terminal to municipal terminal No. 2, where the steamers America and Efin were already berthing. This move put all Astoria boats at the same dock. The Efin added Chinook, Washington, to its calls after dredging operations of the federal engineers opened the channel between Sand Island and Peacock Spit.

● New Steamship Offices.

General Steamship Corporation, Ltd., opened its new Portland district office in the heart of the steamship and transportation district, Fourth and Oak Street, on August 1. Vincent A. Driscoll, district manager, and Roy S. Wintemute, vice-president, held open house on the first day. The new quarters have entrances on both streets, the passenger department opening on Fourth Avenue and the freight department on Oak Street, and are located on the ground floor of the Lewis building, which adjoins the Merchants Exchange quarters.

● Executive Changes.

John P. Doyle, new manager, Port of Portland Commission.

Three of Portland's younger steamship men shifted connections this summer. William D. Hazen resigned as foreign freight agent for McCormick Steamship Company, representing the Danish East Asiatic Line, to become district manager for Burchard & Fisken, Inc., representing Furness and Silver-Java-Pacific lines. A. R. Frey resigned as vice-president and traffic manager of Powell Shipping Company to succeed Hazen, and William A. Allen, freight agent for Powell Shipping Company, moved up to traffic manager, and will represent the joint service of Royal Mail and Holland America Lines. Hazen and Allen are still in the twenties, while Frey is only ten years their senior.

● New Radio Installation.

A new Kolster radio direction finder of the latest type, installed at Portland early in July, is the pride of Captain Walter A. Brunnick, of the Matson freighter General M. H. Sherman.

After leaving Portland, the steamer went to Hawaii, thence to Los Angeles en route to New York with sugar and canned pineapple. Throughout the Portland - Hawaii - San Pedro segments of the voyage, the new direction finder gave accurate readings from all coast stations and from Makapuu Head, Oahu Island, each day.

A loud speaker unit incorporated into the finder makes it possible for the navigator to dispense with ear phones when in relatively close range of radio beacon stations.

The first Kolster direction finder of this type was installed in the United States Lines flagship, Manhattan, and the second in the Cunarder Queen Mary. The installation on the General H. M. Sherman is said to be the first on the Pacific Coast.

● Lumber Cargoes.

Columbia River lumber loadings during the first seven months of 1936 were 30 per cent larger than

those of 1935, according to Portland Merchants Exchange. A grand total of more than 611,000,000 board feet went from the river this year, about 250,000,000 feet bound to Atlantic and gulf ports and 197,000,000 feet to California. The remainder was consigned to Japan, China, Europe, South and Central America, South Africa, Hawaii, and Australia.

● Export Wheat Charters.

Portland definitely entered the export wheat market about the middle of August, when several half-cargo charters for Ireland and Liverpool delivery were reported, and exporters said they expected to receive orders from Japan at any time.

Four vessels were reported fixed to load about 3500 tons of grain each at Portland between August 15 and September 15, finishing with lumber at Vancouver, B.C., all for Irish ports. Meanwhile, 650 tons of wheat was loaded on the Pacific Exporter for Liverpool at a rate declared to be slightly less than 19 shillings, while at least 1000 tons more had been booked on a Holland-America line vessel for 20 shillings. The rate to United Kingdom went to 22/6 during the second week of August and dropped back to 21/3 by the end of the week.

Wheat exporters were confident that Portland will enjoy a brisk export wheat trade until the end of January, when the Argentine and Australian crops will be ready for the market. Crop shortage in Canada, and comparatively small hold-overs in Australia and the Argentine, were given as the forces putting the Oregon-Washington-Idaho region into the market.

Meanwhile, Continental Grain Company and Farmers National Grain Company resumed shipping wheat to gulf ports, after a year's recess. The American steamers American Eagle and Eastern Glade were both chartered for full cargoes, and the former was loaded, while the steamer Point Arena was loaded with a 5000-ton parcel, all for the gulf.

● New Port Manager.

John P. Doyle, an employee of the Port of Portland Commission for 30 years, was appointed general manager of the Port of Portland, effective September 1, upon the acceptance of the resignation of James H. Polhemus, general manager since 1920. Mr. Polhemus resigned to become executive vice-president of the Portland General Electric Company.

William A. Allen.

Mr. Doyle was born at Boise, Idaho, and has resided in Portland for the past forty years. He was at first a clerk with the Port, and during the world war period served as general superintendent. He has since been assistant secretary, handling many of the executive details.

Mr. Polhemus was born at Newport, Oregon, and spent his early years in Portland. He was educated as an engineer, and gained early experience in railroad, bridge, and canal construction. He studied dredge construction and operation for a while with the United States Engineer Corps, and during the war period was manager of the Coos Bay Shipbuilding Company.

William D. Hazen.

Upon joining the Port of Portland in 1920, Mr. Polhemus became active in designing the fine diesel dredges now owned by the port. The Clackamas, one of the largest of its type in the world, was his creation. He also designed and built Swan Island airport, and recently designed the new $1,600,000 airport being erected with PWA assistance. The Port Commission is retaining him as consulting engineer.

● New U.S.A.E. Survey Boat.

A new survey boat, Robert Gray, built for the United States Army Engineers by the Lake Washington Shipyards, Houghton, Washington, was launched on July 31, and had her preliminary trials early in August. She is to be used by the Army Engineer Corps, 1st District, Portland, and was expected to be at work on the Columbia River by September 1. She will be used for survey operations on the river and along the Washington and Oregon coasts.

As will be noted from the illustration, she is a very trim, shipshape steel craft of the seagoing tug type.

She has a length of 117 feet and a beam of 25 feet, and draws 8 feet 6 inches of water when loaded to her marks. She was christened Robert Gray in honor of the discoverer of the Columbia River.

This vessel was equipped with a diesel electric propulsion power plant designed especially to permit very slow and very steady running where such operation is required on river and bar surveys. The plant consists of two 6-cylinder, 4-cycle, 11½-inch by 14-inch Enterprise diesel engines, each with a normal rating of 380 shaft horsepower at 480 revolutions per minute, and each directly connected to a Westinghouse electric generator. These generators supply electric energy to the Westinghouse propulsion motor, which drives the Coolidge propeller, a three bladed screw 79 inches in diameter with 59-inch pitch. During her preliminary trials, Robert Gray developed a speed of 11.28 knots. She is fully equipped to carry a crew of ten and a survey party of six. She is said to have cost $230,000.

. . . Observed at Los Angeles Harbor

Figures from the Division of Shipping Research, U. S. Shipping Board Bureau, Department of Commerce, showing the volume of the foreign trade of all the principal ports of the United States, indicate that for the calendar year 1935 Los Angeles was again second only to New York in the total volume of combined exports and imports. In volume of imports, the Southern California port was No. 9, and in volume of exports No. 2.

Clarence H. Matson, head of the Foreign Trade Department of the Los Angeles Chamber of Commerce, returned early in August from a three-months' trade survey and good will tour through the Orient. He is very hopeful of getting Japan to reduce to a nominal figure her luxury tariff on citrus fruits.

### One Month's Business

The seasonal offshore business summer slump usual in July did not develop this year. During the 31 days, the Port of Los Angeles handled 442,161 tons of foreign trade shipments, valued at $12,358,375. Exports accounted for 371,150 tons, valued at $7,007,312, and imports totaled 71,011 tons, valued at $6,095,385.

Ships arriving during July totaled 603. Total bulk petroleum shipments were 4,659,164 barrels. Lumber received aggregated 60,070,000 board feet.

Captain Paul Chandler, manager of the Marine Exchange of the Department of Commerce, gives the following breakdown of the vessels in port during July:

By type of vessel, there were 210 combination passenger and cargo carriers, 225 general cargo ships, 99 tankers, 52 lumber carriers, and 17 miscellaneous.

By class of service, there were 192 engaged in foreign and non-contiguous coastwise trades, 116 on intercoastal routes, and 295 in coastwise service;

By nationality, there were 442 American, 49 British, 42 Norwegian, 36 Japanese, 7 Swedish, 6 French, 6 Danish, 5 German, 4 Dutch, 2 Mexican, 2 Panamanian, 1 Italian, and 1 Chinese.

### A Good Fiscal Year

For the fiscal year ending June 30, controller Frank E. Rising reported to E. J. Amar, president of the Los Angeles Harbor Commission, a total gross revenue of $2,184,606, an increase of more than $36,000, or about 1.7 per cent over the revenue of the previous year. Gross volume handled during the period totaled 18,652,170 tons, as compared with 17,341,028 tons for the previous year, an increase of approximately 7 per cent. This is said to be the second best year in the history of the Los Angeles Harbor Commission.

Argentine Corn

A large movement of Argentine maize has developed with the rise in price of corn due to the Midwest drought. Since March of this year more than 20,000 tons has been brought into Pacific Coast ports. Bookings have been arranged for a total of 250,000 tons for the Pacific Coast during the rest of the year. It is reported that 120,000 tons of this total is scheduled for Los Angeles harbor.

The New Breakwater

Work on the breakwater is approaching the main ship channel, and the U. S. Lighthouse Service, on August 18, announced that they had established two pairs of range buoys to mark the work limits. These are spar buoys, the spar being white with a green top. Temporary lights marking the channel are only 1,800 feet from the old breakwater light, although the channel will be 2,250 feet wide when the new breakwater is completed.

### New Timber Pier

Spencer Kellogg and Sons Inc. have applied to the U. S. War Department for a permit to build a timber pier along the south side of Cerritos Channel westerly from Ford Avenue, Long Beach. The pier is to be of wooden piling construction with sheet pile bulkhead, and will be approximately 490 feet in length.

### Important Appointment

Sudden & Christenson, effective August 15, have appointed H. H. Morrison as their terminal superintendent at Los Angeles harbor. Mr. Morrison entered the export and import shipping game at Liverpool, England, in 1902, during his 13th year. He has since then served in various capacities with large British, Canadian, and American shipping firms. For 14 years, he has been stationed at Los Angeles harbor as dock agent for the Lehman agency, and as an executive in the Associated Banning Company.

As terminal superintendent for Sudden & Christenson, Mr. Morrison will handle all operations at Los Angeles harbor for steamship lines represented by that agency. These include the intercoastal service of the Arrow Line, the European services of the Hamburg-American Line and Reardon Smith Line, the transpacific service of the Klaverness Line, and the California-Central American-Canal service of the United Fruit Company, in addition to ships of the Kloster Line and of Fernley & Egger, which bunker at Los Angeles on their way to and from the Orient. In all, the agency handles from 15 to 30 ships a month at Los Angeles.

The Port of Los Angeles is such a recent development in its debut as a great harbor that it has the decided advantage that all of its terminals are modern in design, like this example.

● **Port Personals**

James London, customs broker, is now vice chairman of the Foreign Commerce Section of the Harbor and Foreign Commerce Committee of the Chamber of Commerce, succeeding **James H. Smiley,** who has moved to Washington, D.C. The Section chairman is Gustav Riedlin.

Trade Literature

Bulletin 3200-E3, newly published by **Fairbanks, Morse and Co.** describes in detail the operation and construction of their Model 32-E diesel engine. Working features, and the functions of the various parts, are made entirely clear through the use of many drawings and sectional views.

Two fundamental principles underlie the extreme simplicity of this engine: two-cycle (as opposed to four-cycle) design, and air-less injection of fuel. These two features, with the crank-case scavenging principle of air supply and exhaust, require a minimum of moving parts in the engine. This results in greater reliability and lower maintenance costs.

Simplicity of design, modern manufacturing methods, skilled workmanship, and high grade materials, all contribute to the successful performance of the engine wherever power is required. This present Model 32-E represents two decades of constant improvement. It is backed by engines in use totaling more than a million horsepower.

Must Dates for Shipowners

(Continued from Page 305)

tary of Commerce "May in his discretion extend the effective date for a period not exceeding 3 months." So that by March 25, 1937, at the latest, every non-licensed man employed on every American merchant vessel must be a certificated man practically guaranteed to be competent by the Bureau of Marine Inspection and Navigation of the U. S. Department of Commerce.

June 30, 1937. This date, specifically named in the Merchant Marine Act of 1936, is the last day of grace for ocean mail contracts. Section 401, Title IV of that Act reads:

"No contract heretofore made by the Postmaster General pursuant to the provisions of the Merchant Marine Act of 1928, for the carriage of mail, shall be continued in effect after June 30, 1937, and after that date it shall be unlawful for any officer of the United States to pay from any public funds any compensation to the holder of such contract for any services thereunder, except for such voyages as were completed prior to the expiration date herein fixed and for voyages commenced prior to said expiration date and which shall not have been completed prior to said expiration date."

Pacific International Trade Notes

(Continued from Page 313)

Trade Commission to supervise export and import trade and prevent unfair practices.

Philippine exports for May showed a gain of 67 per cent and imports a gain of 17 per cent, as compared with the same period last year.

Netherlands India imports its entire requirements in iron and steel manufactures, but in its hot and humid climate, these imports deteriorate very rapidly, producing large scrap piles. In recent years, Java and Madura have exported much scrap iron and steel. Last year, these exports amounted to over forty thousand metric tons, valued at over a half million dollars.

Regulations covering pearl and sponge fisheries have been changed to allow the government to arrange leaseholds by private contract, instead of public auction to highest bidder, as formerly.

New regulatory restrictions on native rubber production will be imposed on January 1. These will do away with the special impost tax, and stabilize the rubber production by a license coupon control of the individual grower, alloting quarterly production of latex. It is hoped that better prices will result, and a higher income and purchasing power for the native planter.

Marine Insurance Review

Sodium Nitrate Cargo Fires

A Study by the Bureau of Marine Inspection and Navigation

As the result of a disastrous fire on a ship unloading a cargo of sodium nitrate in the port of Baltimore, the Bureau of Marine Inspection and Navigation of the United States Department of Commerce has undertaken a study in the causes of nitrate fires and possible methods of controlling and subduing them. In this work, the Bureau had the assistance of the Bureau of Mines, of the Bureau of Standards, and of the Chilean Nitrate Sales Corporation of New York.

While there are several different nitrates in use for various purposes and these are handled in sufficient quantity to make their transportation a recognized problem, sodium nitrate is produced in far larger quantity than any of the others, and is the one with which this investigation is concerned. Its main use is as a fertilizer. A large portion of the sodium nitrate used in this country comes from Chile, being brought here by ship. It was on one of these vessels that the fire above mentioned occurred.

Sodium nitrate is not an explosive, nor will it "burn" in the ordinary sense. It has, however, a property that renders it dangerous under certain conditions, this being the fact that when heated to somewhat above 700 degrees Fahrenheit, it decomposes, giving off oxygen gas. Thus, a fire in contact with or close to the heated nitrate will continue to burn as long as an inflammable or carboniferous material remains unconsumed. Furthermore, attempts to smother the fire by shutting off drafts, using fire-foam, or similar methods, can have little or no effect.

The nitrate is shipped in bags and also in bulk. The bags are of jute and are lined with paper. It would appear that there is a greater chance of fire when bags are used, as a much larger portion of the nitrate is then in direct contact with inflammable material.

In the Baltimore fire, while the cause could not be positively determined, there seems to be little doubt that it started on the top of nitrate contained in bags under an open hatch. A lighted match or cigarette was thrown down the hatch and dropped into one of the small, confined spaces between the bags. Here sufficient heat could be built up to ignite the bags, adding to the heat, and decomposing the nitrate in contact with the flame.

From then on it appears to have acted like a powder train, rapidly running between the sacks, and in a very few minutes producing flames that rose several feet above the hatch coaming. In a comparatively short space of time, the fire apparently spread all through the bagged cargo and reached the wood dunnage under it, the wooden cargo battens at the ship's sides, hatch covers, and other inflammable material. All ordinary methods of fire fighting having failed, the vessel was finally sunk at the pier.

As evidence of the peculiarly self sustaining character of a nitrate fire, there are records of storage sheds, filled with nitrate of sodium in bulk, in which not only the entire outside of the building has been destroyed, but the supporting posts as well down to the ground, leaving empty holes, the bulk of the nitrate that did not come in contact with the fire remaining intact.

No practicable method of subduing a nitrate fire on shipboard has so far been suggested. While the use of bags may add somewhat to the probability of fire, their use is most desirable, as all nitrate, even when originally shipped in bulk, is eventually bagged for delivery to the consumer. The bulk cargo itself is surrounded by bagged nitrate to keep the bulk material away from the sides of the ship and to prevent it from filtering down into the bilges and other inaccessible places.

These fires must evidently be dealt with from the point of view of prevention rather than "cure."

Evidence submitted relative to the Baltimore fire showed that many who were concerned with the handling of nitrate cargoes, both ship's personnel and stevedores, were not fully aware of the possible danger of fire. They apparently gave no more care to its handling than in the case of any other cargo. Smoking was prohibited upon the ship and docks where the nitrate was being handled, and no evidence was forthcoming to indicate that this rule had been broken, but there can be little doubt that someone started to smoke when the stevedores left the ship, shortly before the fire was discovered, and that a burning match or cigarette, thrown down the open hatch, was the immediate cause.

On the other hand, the nitrate companies themselves are fully aware of the dangers involved, have formulated stringent rules against smoking, and endeavor to see to it

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that these rules are strictly enforced.

It seems evident that the only feasible improvement in the situation can come from increased vigilance on the part of those in immediate charge of the shipping and handling of nitrate, and the implanting in the minds of the stevedore gangs actually doing the work, a full realization of the dangers involved and their personal responsibility for reducing these dangers to a minimum.

Marine Insurance Notes

Diesel Engine Insurance: The National Bureau of Casualty and Surety Underwriters has recently put in force a substantial reduction in rates to apply on diesel engines with closed cooling systems. This was accomplished largely through the efforts of the United States Diesel Engine Manufacturers Association. It is the first step in their program for the rationalization of diesel engine insurance. It is hoped that this first step will be followed by similar recognition of the practical value of other protective equipment.

The marine underwriters have not yet adopted this policy, but still rate all marine diesels in the same risk class. That, however, is perfectly natural for marine underwriters. They have learned from long experience with sea risks that the installation of safety equipment on marine machinery does not of itself reduce the risk. The factor that counts at sea is the personal equation. When a sufficient number of closed cooling systems on diesels at sea have proved their relative freedom from risk, then the marine underwriters will fall in line.

Price of a Hand: The safety engineer of the British Columbia Lumber Mills Association had trouble with the men feeding the planers. These men would reach in to pull out slivers from the planer in operation, and a number of right hands were chewed up by the planer. Studies were made as to the cost of shutting down machines to remove slivers. Figuring all costs, it was determined that for the price of one hand the old fashioned belt driven planer could be stopped and started 50,000 times, and the modern, fully motorized planer 25,000 times. When these figures were put before the management, the order went out immediately to all foremen to have machines stopped for clearing slivers. Never take an unnecessary risk in handling machinery.

Another Oldest Ship: The Swedish auxiliary schooner Lisa, according to the Waterways Journal, St. Louis, Missouri, is claimed to be the oldest vessel afloat. "She was built in 1799 of holm oak, is as strong now as the day she was finished. Originally built for the Danish navy, during her early career she ran in the Greenland and Iceland trade. A 25-horsepower auxiliary engine was installed in 1925."

Insurance Education: On August 6, J. B. Levison, president of Fireman's Fund Insurance Company, awarded cash prizes to Crawford Mortenson, Edward P. Coughlan, and Robert F. Coyle, for high grades attained in examination of the Insurance Institute of America fire courses conducted under the auspices of the Fire Underwriters Association of the Pacific. Fireman's Fund each year awards prizes to the student attaining the highest grade in each of the three divisions of the Institute's fire insurance courses.

Crawford Mortenson, with a mark of 92, was first among the 16 students in the second division and, as high mark man of all divisions, received first prize of $50.00. In the junior division, Edward P. Coughlan, and in the senior division, Robert F. Coyle, were high men, each with a mark of 88 and each receiving $25.00.

Mortenson and Coyle are both in the fire underwriting department of the San Francisco office of the Fireman's Fund, while Coughlan is in the

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Shipowners' Liability: The new Federal law on shipowners liability is very stringent, and would seem to eliminate all loopholes. In all cases involving loss of life or bodily injury, the minimum liability is set at $60.00 per ton, with an arbitrary formula for computing tonnage and a provision that "the privity or knowledge of the master of a seagoing vessel or of the superintendent or managing agency thereof, at or prior to the commencement of each voyage, shall be deemed conclusively the privity or knowledge of the owner of such vessel."

Insurance and Advertising: An Oklahoma girl advertised for a husband and landed him. The ad cost $3.00, the wedding $6.00, a total of $9.00. The husband lived less than a year, then left her a life insurance policy of $11,000. Moral: Advertise and insure—both pay dividends!

Vocal Warnings: The skipper of one of our ultramodern seagoing hotels, who has been a shipmate with all the gadgets now becoming compulsory on the instrument boards of passenger liners, would feel quite at home if he should be called upon to navigate one of the new safety flivvers fitted with that great little invention known as the oral speedometer. This lifesaver is fitted

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with an automatic phonographic attachment that has the following remarks to make as speed increases:

At 35 miles per hour: "Too fast for city driving. We hope you're in the country."

At 45 miles per hour: "Your car is still under control, but watch the car behind the car ahead of you. Have you had your brakes tested recently?"

At 50 miles per hour: "Your responsibility is increasing. Keep your eyes on the road."

At 60 miles per hour: "Are your insurance premiums paid to date?"

At 70 miles per hour: "You drive. This attachment will do the praying."

At 80 miles per hour: "Someone will probably have this car repaired. If so, we thank you for the sale of a new speedometer to replace this one, which in a few moments is going to Hades along with you."

"Ounce of Prevention."

Unusual Range of Fog Sound Signal: Sometimes sound signals are heard for long distances at sea, and a recent instance of this is related in the United States Lighthouse Bulletin as follows:

"The master of the Cities Service Koolmotor, American oil tanker, has reported that on July 7, when approaching Nantucket Lightship from the southwest in hazy weather, smooth sea, and with west wind, force 3, the whistle of the lightship was heard for about 30 miles, the signal having been picked up at 9:35 p.m. and the lightship abeam at 12:44 a.m., three miles off. The fog signal on Nantucket Shoals Lightship is a two-tone type F diaphone operated by compressed air and equipped with a vertical resonator with mushroom top."

GEO. E. BILLINGS
CO.
Pacific Coast General Agents
Richard J. Lutich, Marine Manager
Standard Marine Insurance Co.
National Union Fire Ins. Co.
Mercantile Insurance Co.
of America
312 CALIFORNIA STREET
SAN FRANCISCO - - CALIFORNIA
Telephone GArfield 3646
Seattle Offices: Colman Bldg.
Telephone SEneca 1478

Distance Finding: The method of distance finding by synchronized sound and radio beacon signals is working out very nicely along the coasts of the United States. It was tested out recently by the United States Coast and Geodetic Survey vessel Oceanographer, which, on the morning of June 11, was at anchor in a dense fog about a mile and a half northeast of the Fire Island Lightship. The wind was from the southwest. On board was an ordinary stop watch with a special paper dial marked directly for nautical miles instead of seconds. So the surveyors amused themselves by checking up the "distance finding" signals. They reported: "At various times throughout the morning, tests were made. The distances as shown on the watch dial varied less than a tenth of a mile from each other. There is no doubt as to the accuracy and desirability of this service. The best feature in using the stop watch in connection with the observations is that it can be used in any part of the ship where the radio signal can be heard, and even in the dark. An officer on the bridge with a loudspeaker in the pilot house can use it, and by means of a small flashlight know his distance off such a station."

Twenty-Five Years Ago: Pacific Marine Review for September, 1911, carries a page of interesting "Marine Insurance Notes," from which we extract the following comment on "War Risks":

"The diplomatic friction consequent on the action of Germany in the question of Morocco has caused a considerable amount of fluttering in the dovecotes of underwriting. Most British underwriters are willing to delete the free from capture and seizure clause from policies without any additional premium; in fact, agree to do this on the understanding that they may withhold the concession on giving 15 days' notice. As a consequence, a notice was posted at Lloyds on July 26 advising brokers that the clause would be maintained on all policies signed after the 9th of August. In the case of shipments of nitrate from the West Coast of South America by sailing vessels, underwriters agree to delete the clause, for which they receive an additional premium of 1/16 per cent. This agreement may also be modified by a notice of 30 days, and on August 1 the notice was duly posted.

"There was nothing unusual in the attitude of underwriters, for they were simply placing themselves in the position of prudent business men. The war risk is expressly excluded from a marine policy; it is a risk the hazard of which can only be estimated from day to day, should there be any outbreak of hostilities. In ordinary times of peace, underwriters delete the clause to meet the requirements of bankers who desire full protection; but when the dogs of war are on the leash, the risk is such that it cannot be estimated with any degree of accuracy. In fact, many underwriters decline the business altogether.

"Barely six years ago, in the Russo-Japanese war, risks were accepted on the "Princess Marie" and "Ikhona" at a nominal premium of ⅛ per cent. Both steamers were sunk and underwriters had to pay a total loss in each case, although negotiations with the Russian Government have since resulted in substantial payments as compensation."

MARINE DEPARTMENT
Aetna Insurance Co.
Queen Insurance Co.
Maritime Insurance Co., Ltd.
Fidelity Phenix Fire Ins. Co.
Commercial Hull Dept.
Automobile Ins. Co.
MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at
Colman Bldg. Seattle
111 West 7th St. Los Angeles

On the Ways-

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Edited by F. DRYDEN MOORE

Plans for Reconditioning Malolo Completed

One of the largest reconditioning contracts on the Pacific Coast has been let to the Bethlehem Shipbuilding Corporation by the Matson Navigation Company, who have authorized an expenditure of approximately a half million dollars for the remodeling of their express liner, the Malolo. Eighteen de luxe passenger "lanai suites" will be added to the vessel's accommodations, her life boats will be lifted to the navigating deck, thus changing her exterior appearance, and her freight capacity will be approximately doubled.

Construction work is scheduled to begin on October 5, provided that satisfactory labor conditions exist at that time, and will be carried on at the yards of the Union Iron Works, in San Francisco Bay.

The Malolo will be out of service until the first of the year, after she arrives from her final Hawaiian voyage on October 3, and is expected to be completed in time to reenter her California-Hawaii run on January 9.

According to plans and specifications outlined by J. E. Ryan, general passenger manager of the company, the construction work will give Malolo the effect of a new ship. He says:

"With all life boats lifted from B to the bridge-navigating deck, it will permit the installation of eighteen lanai suites, whose furnishings will be on a par with any ship. It will widen the A deck promenades by a full thirteen feet, and permit the installation on the navigating deck of the most modern McLaughlin type gravity davits, which meet the full requirements of the United States Bureau of Inspection.

"All lanai suites are to be completely aid conditioned, and throughout the ship, uniform fresh water installations will replace the present salt water equipment previously supplying the baths. Fresh water will be used exclusively.

"The lanai suite furnishings will be of a type suitable for the tropics, where much of her travel is scheduled, and in many respects will be similar to those of the Lurline, newest of the company liners."

In addition to the fine improvements outlined by Mr. Ryan, there will also be an extension of the present refrigeration system, permitting the handling of almost double the present cargo under this classification. This will equip Malolo with one of the largest refrigerating units in the American merchant fleet on the Pacific, and make her a valuable factor in the fresh fruit commerce to and from the islands.

An amount of $408,000 will be required to give Malolo these additional advantages, that figure being low in the three bids received by Matson Line.

Such a program is a tangible evidence of the revival of shipbuilding on the Pacific Coast, and we believe it is just the beginning of a great boom in this industry.

Six Purse Seiners Built by Pacific Yard

Recent construction at the Western Boat Building Company, Tacoma, Washington, included six fishing vessels of the purse seine type, for use in various fisheries of the Pacific Coast. They range from 84' x 20' to 87' x 22', and are powered with 240-horsepower engines, three vessels employing the Atlas Imperial and three the Washington diesel engines. The vessels were built for owners located from San Pedro to Alaska.

Sun Shipbuilding Awarded Contract for Two Tankers

Contracts have been closed by Sun Shipbuilding & Dry Dock Co., Chester, Pennsylvania, for the construction of two tankers for the Texas Company. Each of these vessels will be single screw diesel propelled, and of approximately 12,000 tons deadweight. The dimensions of these tankers are: LBP, 465 feet; beam molded, 64 feet; depth molded to upper deck, 34 feet 6 inches; loaded draft, 27 feet 3 inches.

World's Largest Drydock Bids to be Submitted

On September 30, at the Bureau of Construction and Repair, Navy Department, bids for the construction of the world's largest floating drydock, 1075 feet by 165 feet, will be opened. The estimated cost of the structure is $10,000,000. When completed, it will have a capacity sufficient to handle the major navy ships, and will be towed to its home port, Pearl Harbor.

Owing to the great size of the dock, contract for its construction must be placed with a yard located on the Pacific Coast, as it will not be possible to bring it through the Panama Canal. It is thought probable that one of the three San Francisco Bay yards may be awarded the contract, owing to their proximity to Pearl Harbor.

Cunard Planning Two New Ships

Plans for at least two new ships for the Cunard White Star Line are under way, the directors of the line advocating ample modern ships to compete successfully with other companies. The ships will be of the cabin class type, suitable for the passenger who does not require speed as a factor in transatlantic transportation, and will more or less follow the well-known profile of vessels operated by the line, with probably greater streamlining of the superstructures than heretofore.

Union Oil Company Considering Tanker Additions

Authorization of construction of two or perhaps four new tankers is expected within the year by the Union Oil Company. While details are incomplete at present, the ships will probably have a speed of over 12 knots, and will be propelled by high pressure turbines, according to the policy of the marine division of the company. The building program is intended to replace old tonnage by the addition of these vessels, and it is expected that they will not be built on loans from the government, but will be financed by the company.

Contract for Fireboat Awarded Defoe

Contract for the construction of a 90-foot diesel fireboat for the City of Chicago has been awarded the Defoe Boat & Motor Works, Bay City, Michigan, at a cost of $134,000. The boat will be completely equipped and modern in every way, with a speed of 15 knots.

Submarine Pickerel Launched

The Electric Boat Co. launched the 1400-ton Navy submarine Pickerel at its plant, Croton, Connecticut, on July 7. The submarine is one of three sister vessels that the U. S. Navy Department authorized in 1934, awarding the contract to the Electric Boat Co. Her cost is $2,387,000.

Trawler Contract Goes to Bath Iron Works Corp.

Contract has been awarded Bath Iron Works Corp. for the construction of a diesel trawler 133 x 25 x 13 feet, to be equipped with Fairbanks-Morse engines. The vessel will have a displacement of 550 tons, and will be operated by the Booth Fisheries Co., Boston, Massachusetts, owners.

Ingalls to Build Oil Barge

The Standard Oil Co. of Kentucky is understood to have awarded a contract to Ingalls Iron Works Corp., Birmingham, Alabama, for an 8,000-barrel oil barge, further particulars of which are not available.

Hopper Barge Awarded Treadwell Construction Co.

It is believed that the Parsons & Rader Transportation Co., of Zanesville, Ohio, has awarded a contract to the Treadwell Construction Co., Midland, Pennsylvania, for a steel hopper barge 100 feet long by 26 feet wide by 6 feet deep.

Dravo Contracting Company Builds Oil Barge

Patterson Oil Terminals, Inc., Philadelphia, Pennsylvania, have awarded contract to Dravo Contracting Co., Pittsburgh, for construction of a welded oil barge 110 x 30 x 11 feet, with a gross tonnage of 335.

Contract for Towboat Awarded

St. Louis Shipbuilding & Steel Co., St. Louis, Missouri, has been awarded a contract for construction of a diesel towboat by the Tennessee Valley Authority, Knoxville, Tennessee, at a cost of $21,150. Five yards entered bids for the boat.

U. S. Engineers Asks for Dredge Bids

The U. S. Engineer at St. Paul has received bids for construction of a 267-foot turbo-electric steel dredge, the Charles Hegewald Corp., New Albany, Indiana, being the low bidder at a main contract price of $690,000, not including the time element. Two other yards submitted bids, Dravo Contracting Co. being low on an alternate bid of $625,750.

The dredge will be 267 feet overall, 230 feet between perpendiculars, 49 feet breadth, and 8.6 feet depth. It will be constructed for use on the Great Lakes and inland waterways for flood control projects and port and navigation improvements.

Diesel Tanker to be Built by Mathis Company

John H. Mathis Co., Camden, New Jersey, was awarded contract by Chester A. Poling, Inc., New York, for the construction of a diesel-propelled oil tanker, which will be equipped with an Atlas Imperial engine. The tanker will be 125 x 27 x 11 feet, and will have a gross tonnage of 250. It will be operated on rivers and in harbors after its completion in November.

Treadwell Low for Construction of Steel Scows

The U. S. Engineer at Cincinnati, Ohio, has received bids for the construction of two completely equipped riveted steel dump scows, Treadwell Construction Co., Midland, Pennsylvania, being low at $39,400.

American Bridge Company Gets Barge Contract

Contract for the construction of seventeen steel barges has been awarded the American Bridge Company, Ambridge, Pennsylvania, by the American Barge Line. No details are as yet available.

Jakobson & Peterson to Build Towboat

The Lewis Coal & Oil Company, Port Washington, Long Island, New York, has awarded contract to Jakobson & Peterson, Inc., foot of 16th Avenue, Brooklyn, New York, for construction of a combination towboat and oil tanker. The vessel, to be all-welded, will be propelled by a 300-horsepower diesel engine, and will be delivered in November.

New York City to Have Another Fireboat

Authorization of tax notes amounting to $50,460 for plans and specifications and supervision of construction for a new fireboat was made by the New York City Board of Estimate, the boat to cost approximately $720,000. This will bring the fireboat fleet up to ten boats, its full strength. The new boat will discharge from 16,000 to 18,000 gallons of water per minute, and it will have a two-way radio, foamite generators, and several other modern improvements.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400)**. Completion date 9/19/37, **Hull 5356—Maury (DD401)**; completion date 12/19/37; two 1500-ton destroyers for U. S. Navy.

Hull 5359, Pacific; seagoing hopper dredge for U. S. Engineers; completion date, April 2, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Antigua, M.S. Roseville, Maui, George G. Henry, Democracy, Tug A. H. Payson, Richmond, W. S. Rheem, D. G. Scofield, Cathwood, Horace Luckenbach, Santa Rosa, Chiriqui, Maui, Charles R. McCormick, F. H. Hillman, American Fisher, Tug Tatoosh, Talamanca, Dredge Multnomah, Pres. Cleveland, District of Columbia, Frank G. Drum, Santa Elena, M.S. California Express, M.S. Silverbelle, Frank H. Buck, Pres. Pierce, H. T. Harper, Makura, M. B. Richlube, Calmar, H. M. Storey, W. S. Miller, Point Arena, F. H. Hillman, Matsonia, Point Ancha.**

FELLOWS AND STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **4 keels laid** July 6, 1936, Fellows Craft stock cruisers 30′ x 8′ x 2′6″, powered with Kermath Sea Flyer 6-cylinder 85-H.P. engines with 2 to 1 reduction gears; **completion date September 1.**

DRYDOCK AND ROUTINE REPAIRS: 12 yachts 30′ to 80′ on ways.

Vultee seaplane with 840 H.P. engine tuned up. Left for Moscow, Russia, at 11:15 A.M. August 5.

GENERAL ENGINEERING AND DRYDOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Angel Island, Dredge Culebra, Ship Star of Lapland, Barges No. 201, No. 102, No. 62 and No. 200, Barge S.O. Co. No. 4, M.S. Neptune, Scotia, Barge S.O. Co. No. 5, W. S. Miller, W. R. Chamberlin, Jr., Unimak, R. M. Woodward, Cadaretta, Stanwood, Noyo, Hoquiam, Despatch No. 1, Midway.**

HARBOR BOAT BUILDING CO.

Berth 264—Fish Harbor
Terminal Island, Calif.

NEW CONSTRUCTION: **Four 80′ U. S. Coast Guard patrol boats; 1,600 H.P.** each; Liberty-Vimalert conversions; speed 30 m.p.h.; expected completion, July, 1937.

One 83′ x 22′ beam purse seine fishing boat Sea Breeze, for John Madison and partners; 230-H.P. Union diesel engine; **completed August, 1936.**

One 85′ x 22′ beam purse seine fishing boat for Vince Simich and partners; 230-H.P. Union diesel engine; **completed August, 1936.**

One 86′ x 22′ beam purse seine fishing boat for Nick Mosich, 275-H.P. Union diesel engine; **completed September, 1936.**

DRYDOCK AND ROUTINE REPAIRS: Purse seine fishing boats Vagabond and Long Island, repairs to rudder, and repairs to hull, respectively.

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **M.S. Buenos Aires, Yacht Dorade, Yacht Minerva, Makiki, President Wilson, Yacht Destiny, President Monroe.**

LAKE WASHINGTON SHIPYARDS

Houghton, Washington

NEW CONSTRUCTION: 117′ steel diesel electric survey boat **Robert Gray** for U. S. Engineers, Portland, Oregon; launched July 27, 1936.

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **M.V. Minerva, M.V. W. B. Walker, Yacht Breezin Thru, Golden Hind, Golden Peak, Yacht Serena, Tug John N. Stewart, L. A. Fireboat No. 2, Launch Betty O, Cathwood, Yacht Radio, S. O. Barge No. 7, Yacht Enchantress, Los Angeles, Diamond, M.V. California Express.**

THE MOORE DRYDOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Crowley Barge No. 2, Condor, Redwood, Olinda, Coya, Tacoma, Tug A. H. Payson, E. P. Ripley, Sobre Los Olas, Missourian, Dakotan, Western Union Barge, Danish M.S. Norpol, Diana Dollar, H. T. Harper, Melville Dollar, Panaman, Bengalen, S. C. T. Dodd, Diamond Head, Kansan, Davenport, R. J. Hanna, Richmond, Polarine, President Pierce, Brunswick, Oregonian, Dorothy Wintermote, District of Columbia, Cutter Golden Gate, El Segunda, Manoa.**

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

DRYDOCK AND ROUTINE REPAIRS: Pacific Airways seaplane docked for examination.

Two scows docked, cleaned, painted, miscellaneous hull repairs.

Seven fishing boats docked, cleaned, painted, miscellaneous hull and engine repairs.

42 ship repair jobs not requiring docking.

26 commercial jobs.

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Cushing** (Destroyer No. 376); standard displacement 1500 tons; LBP, 334′; beam, 35′⅛″; loaded draft, 10′10″; geared turbine engines; express type boilers; keel laid August 15, 1934; launched, Dec. 31, 1935.

U.S.S. Perkins (Destroyer No. 377); standard displacement 1500 tons; LBP 334′; beam, 35′⅛″; loaded draft, 10′ 10″; geared turbine engines; express type boilers; building under provisions of National Industrial Recovery Act; keel laid November 15, 1934; launched Dec. 31, 1935.

U.S.S. Patterson (Destroyer No. 392); standard displacement, 1500 tons; keel laid July 23, 1935; estimated completion date, February 1, 1937.

U.S.S. Jarvis (Destroyer No. 393); standard displacement, 1500 tons; keel laid August 21, 1935, estimated completion date, May 1, 1937.

Construction of **Destroyer No. 408, U.S.S. Wilson**, 1500 tons, keel not yet laid.

DRYDOCK AND ROUTINE REPAIRS: **Northampton, California, West Virginia, Ranger, New York, Chicago, Houston, Gannet, Thrush, Omaha, Brazos, Swallow, Mahopac, Tatnuck, Challenge, Wando, Aroostook, Jason, Kearsarge (Crane Ship), Patoka, Pawtucket, Promtheus, Pyro.**

STEPHENS BROS. BOATYARD
Stockton, Calif.

NEW CONSTRUCTION: **One 48' cruiser,** teakwood hull, equipped with Scripps 164-165 motors.

Two 36' stock cruisers; one partially constructed, and one under construction.

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **Katrina Luckenbach, Mauna Loa, Dredge Missouri, M.S. Standard Service, Tug Iroquois, Point Caleta.**

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Smith**, Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934, launched April 22, 1936.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935.

Pompano, Submarine (SS181); estimated delivery August, 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Hull No. 119, fishing vessel**, New Satrania, owned by Frank Tardio of Monterey. Length 86 x 20; 240 H.P. Atlas Imperial engine; **launched August 5, 1936; delivery date, September 1, 1936.**

Atlantic, Lakes, Rivers

THE AMERICAN SHIP BUILDING COMPANY
Cleveland, Ohio

DRYDOCK AND ROUTINE REPAIRS: Conversion of George F. Rand from a bulk freighter to a self-unloading vessel.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hull No. 159, **Drayton (DD 366)**, torpedo boat destroyer. U.S. Navy; keel laid, March 20, 1934; launched March 26, 1936; **delivered August 26, 1936.**

Hull No. 160, Lamson (DD 367), torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launched June 17, 1936; **estimated delivery October 15, 1936.**

Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis** and **DD396 Jouett**; Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively, **DD-396**, keel laid, Mar. 26, 1936. **DD395**, keel laid July 28, 1936. **DD394**, keel laid April 8, 1936.

Hulls Nos. 164, 165, and 166, trawlers, single screw, steel, diesel propelled, **for delivery in September** and October, 1936, to Boston, Mass., owners.

Hull No. 167, Ferryboat **Aquidneck.** Diesel electric ferry for U.S. Navy; estimated delivery, March, 1937.

Hull No. 168, Trawler, single screw, steel, diesel propelled, for delivery to Boston, Mass., owners, during December, 1936.

Hull No. 169, Trawler, single screw, diesel propelled, for delivery to Boston, Mass., owners in April, 1937.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA44, Vincennes**, 10,000 tons. Estimated delivery January, 1937. Keel laid January 2, 1934.

DD363, Balch, keel laid, May 16, 1934; **estimated delivery, Sept., 1936.**

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7, Airplane Carrier for U.S. Government; estimated delivery, September 1938.

Hull 1461, Neptune, steel trawler; 350 H.P.; **launched August 6, 1936; estimated delivery, August, 1936.**

Hull 1462, Triton, steel trawler; 350 H. P. **estimated launching, August, 1936; estimated delivery, September, 1936.**

BETHLEHEM SHIPBUILDING CORPORATION
Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers**—steam—425'x64'x34' for Gulf Refining Co.; total tonnage 7070 each.

CHARLESTON SHIPBUILDING & DRYDOCK CO.
Charleston, S.C.

NEW CONSTRUCTION: **One 60-ft. all-welded lighter** for stock. Rebuilt 6 lighters (wooden) for Chesapeake Corp.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One 175'x34' x10' tender** for U.S. Lighthouse Dept. Two triple expansion steam engines; total horsepower 1000; keel laid July 1, 1936; estimated delivery, February 1, 1937.

One 115' twin screw diesel yacht, 115' long, 17'6" beam; total horsepower, 450; completion date, October 1, 1936.

One fire boat for City of Chicago, 90' 6" long, 22'4" beam; diesel power; pumping capacity, 7,500 gallons per minute at 150 pounds; delivery January 1, 1937.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION **Hull No. 997**, one diesel sternwheel towboat of 91 gross tons.

Hull No. 1265, one welded flush deck cargo box barge 100' x 26' x 6'6", of 165 gross tons.

Hull No. 1266, one steel 20" pipe line dredge for U. S. Engineer Office, St. Paul, Minn., of 1987 gross tons.

Hull No. 1268, 1 steel hull for towboat, 173'x34'6"x7'2" for John W. Hubbard, Pittsburgh, Pa.; 770 gross tons.

Hulls Nos. 1282-1291 inclusive; 10 welded "W-3" coal barges 175' x 26' x 10'8"; 4720 gross tons.

Hulls Nos. 1292-1295 inclusive; 4 welded flush deck cargo box barges 130' x 30' x 7'6"; 1000 gross tons.

Hull No. 1296, one welded cattle barge 196' x 36'6" x 8' for Jersey City Stockyards; 1300 gross tons.

Hull No. 1297, one welded oil barge 110' x 20' x 11' for Patterson Oil Terminals, Inc., Philadelphia, Pa.; 335 gross tons.

Hulls Nos. 1300-1309, inclusive; ten welded type W-3 coal barges, 175' x 26' x 10'8"; 4,720 gross tons.

Hull 1310, one welded steel coal barge, 134' x 34' x 16', of 362 gross tons.

Hulls 1311-1313, inclusive; three riveted sand and gravel barges 100' x 26' x 6'6", for Smoot Sand and Gravel Corp., Washington, D. C.,; 495 gross tons.

This makes a total of 34 hulls under contract, with a total gross tonnage of 15,945.

ELECTRIC BOAT CO.
Groton, Conn.

NEW CONSTRUCTION: **Hull No. 23, Perch**, S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; launched May 9, 1936.

Hull No. 24, Pickerel, S.S. 177 keel laid March 25, 1935; launched July 7, 1936.

Hull No. 25, Permit, S.S. 178, keel laid June 6, 1935; estimated launching, October 1936.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

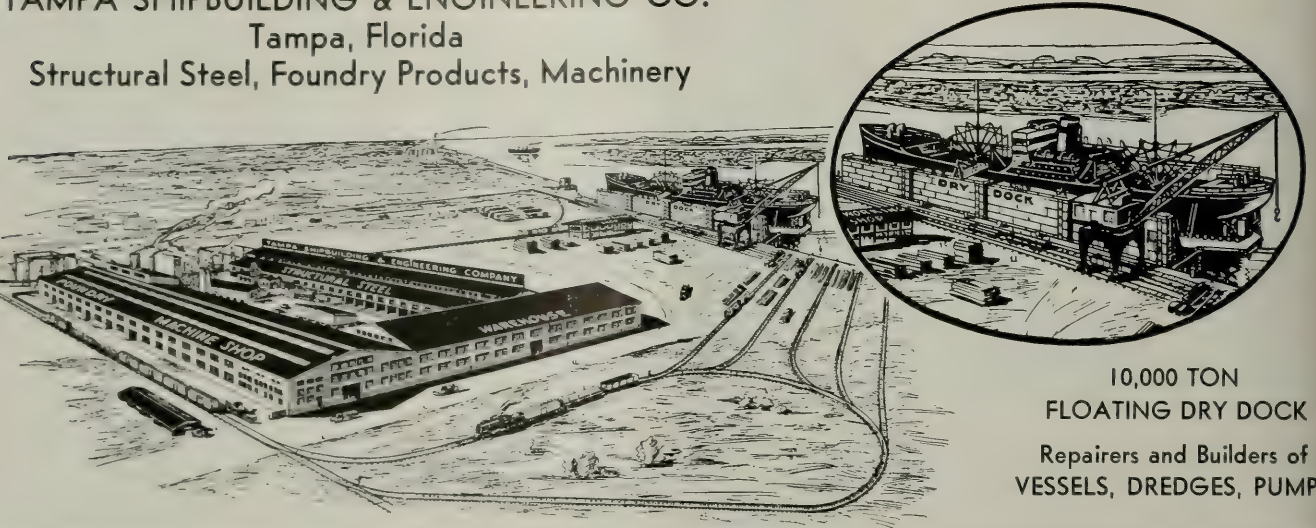
Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION: Two destroyers, **DD368 Flusser** and **DD369 Reid** for the U. S. Navy, estimated completion dates: Flusser, April 15, 1936; Reid, May 15, 1936. Flusser launched Sept. 28, 1935.

Two destroyers, **DD381 Somers** and **DD383 Warrington**; keels laid June 27, 1935 and October 10, 1935, respectively; estimated completion March 1, 1937.



TAMPA SHIPBUILDING & ENGINEERING CO.
Tampa, Florida
Structural Steel, Foundry Products, Machinery

10,000 TON
FLOATING DRY DOCK
Repairers and Builders of
VESSELS, DREDGES, PUMPS

PLANT: 19TH & GRANT STREETS — PHONE Y-1112 THIS DRY DOCK WILL BE READY FOR BUSINESS IN OCTOBER

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938.

Two 12,800 ton tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; estimated completion dates October 1936 and December 1936, respectively.

Four 12,800-ton tankers for the Standard Oil Company of New Jersey; Isherwood Arcform design of hull form and longitudinal hull framing.

THE INGALLS IRON WORKS COMPANY

Birmingham, Ala.

NEW CONSTRUCTION: **One oil barge** 195′ x 35′ x 8′9″ for Standard Oil Company of Kentucky, Louisville, Kentucky.

Three oil barges 125′ x 30′ x 7′; **three oil barges** 150′ x 30′ x 7′; for International Petroleum Co., Ltd. (Tropical Oil Co.) Toronto, Ontario.

JAKOBSON & PETERSON, INC.

Ft. of 16th Avenue
Brooklyn, New York

NEW CONSTRUCTION: **One 88′ all welded steel tow boat** for Dauntless Towing Line of N.Y. To be powered with 650-H.P. Cooper-Bessemer diesel engine.

One 65′ all welded steel combination tow boat and tanker for the Lewis Coal & Oil Corp. of Port Washington, N.Y. To be powered with 300-H.P. Atlas Imperial diesel engine.

MANITOWOC SHIPBUILDING CO.

Manitowoc, Wis.

NEW CONSTRUCTION: **One steel dump scow and one steel dry dock section** for Great Lakes Dredge and Dock Co., Chicago, Ill.

One steel dump scow for Fitzsimons and Connell Dredge and Dock Co., Chicago, Illinois.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, West Virginia

NEW CONSTRUCTION: **One sternwheel river steamer**, 200′ x 44′ x 5′6″.

Ten standard river coal barges, 175′ x 26′ x 11′.

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION: **H 359** aircraft carrier **CV5, Yorktown, for U. S.** Navy; keel laid May 21, 1934; launched April 4, 1936; original contract for delivery, October 3, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; original contract for delivery February 3, 1937.

H361, light cruiser, CL47, Boise, keel laid Apr. 1, 1935; original contract for delivery, August 22, 1937.

H362, light cruiser CL49, St. Louis; estimated keel laying Sept. 7, 1936; estimated delivery, Jan. 2, 1939.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION: Contract for three destroyers: **Hull No. 408, Porter (DD356)**, launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357)**, launched April 18, 1936; **Hull No. 411, Winslow (DD-359)**; of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42). Hull No. 413. Nashville (CL43), and **Hull No. 416 Phoenix (CL46)** of 10,000 tons each for the U.S. Navy Department; keels laid, 1935;

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION: **Hulls Nos. 1064 and 1066—two steel hull towboats** building for Donaldson Towing & Lightering Co., Phila., dimensions: 95′ L.O.A. 88′ L.B.P. x 24′ x 14′ 9″; one Unaflow vertical marine type engine, two cylinders 25″ dia. x 20″ stroke, 130 R.P.M. 600 I.H.P. One Scotch type boiler 13′ 3″ diam. x 11′ 6″ long, 3 furnaces, 185 lbs. W.P. Estimated delivery, October, 1936 and January 1, 1937, respectively.

SPEDDEN SHIPBUILDING CO.

Baltimore, Md.

NEW CONSTRUCTION: **57 ft. all welded steel hull dredge tender** for Atlantic Gulf & Pacific; L.O.A. 57′ 7″; beam 14′ 0″; depth 7′ 0″; power 140 B. H. P. Fairbanks Morse Diesel Engine.

SUN SHIPBUILDING COMPANY

Chester, Pa.

NEW CONSTRUCTION: **Hulls No. 155-156.** Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485′6″x68′0″x37′0″; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; **launching Sept. 19, 1936**; delivery Oct. 10, 1936. Estimated dates for Hull No. 156. Keel laying March 16, 1936; launching October 31, 1936; delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511′x65′9″x37′; 15,800 tons.

Hull No. 160, 1 oil tanker (steam) 520′x70′x40′ for Atlantic Refining Co.; 18,500 tons.

Hulls No. 161 and 162, steam tankers for Standard Oil Company of New Jersey; 422′ x 65′ x 35′; 12,900 dwt.

Hulls No. 163 and 164, diesel tankers for The Texas Company; 465′ x 65′ x 34′6″; 12,000 dwt.

TREADWELL CONSTRUCTION COMPANY
Midland and Erie, Pa.

NEW CONSTRUCTION: **10 Coal Barges** 175′x26′x11′, for Pittsburgh Coal Co.

1 steel gold dredge (ladder type) **hull** 155′x70′x13′ for South American firm.

1 barge 100′ x 24′ x 6′ for Parsons & Rader.

Four barges 100′ x 26′ x 6′6″ for Pittsburgh Gravel Co.

Two dump scows 93′ x 22′ x 8′10″ for U. S. Engineer, Cincinnati, Ohio.

24 pontoons 48′ x 16′ x 2′6″ for U. S. Engineer, St. Paul, Minn.

UNITED SHIPYARDS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION: **DD364, Destroyer Mahan,** keel laid June 12, 1934; launched October 15, 1935; **completed September 1, 1936.**

DD365, Destroyer Cummings, L.B.P. 334′; beam 35′; mean draft 10′10″; keel laid June 26, 1934; launched Dec. 11, 1935; estimated delivery October 22, 1936.

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; launched April 18, 1936; estimated delivery, December 9, 1936.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334′0″; beam 35′0″; mean draft 10′10″; keel laid Apr. 10, 1935; **estimated launching, September 15, 1936;** estimated delivery, February 9, 1937.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267′ overall, 66′ extreme breadth, 19′9″ depth; keels laid April 4, April 27, and May 1, 1936, respectively; estimated launching, November 17, December 8, and December 29, 1936, respectively; estimated delivery, January 19, Feb. 9, and March 2, 1937, respectively.

UNITED STATES NAVY YARD
Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case,** L.B.P. 334′; beam 35′; depth 19′8″; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, November, 1936.

Destroyer DD371, Conyngham, L.B.P. 334′; beam 35′; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, December, 1936.

DD389, Mugford, and DD390, Ralph Talbot, two light destroyers; LBP 334′; beam 35′6″; depth 19′8″; keels laid October 28, 1935; estimated delivery, April, 1937 and July, 1937, respectively.

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334′; beam 35′6″; depth 19′8″; estimated delivery, June and August, 1938.

UNITED STATES NAVY YARD
Charleston, S.C.

NEW CONSTRUCTION: **U. S. S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; launched Feb. 25, 1936; **completed September 15, 1936.**

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; estimated launching Oct. 20, 1936; estimated completion, Jan., 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser. L.B. P. 600′; beam 61′8″; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, November, 1936; estimated delivery May, 1937.

CL 48, **Honolulu,** light cruiser; L.B. P. 600′; beam 61′8″; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January, 1937; estimated delivery October, 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600′; beam 61′7¾″; standard displacement 10,000; geared turbine engines; express type boilers; contract delivery, May 16, 1939.

PG. 50, **Erie,** gunboat; L.B.P., 308′; beam, 41″; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; launched January 29, 1936; estimated delivery, October 15, 1936.

CG 69 and CG 70, **Alexander Hamilton and John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308′; beam 41′; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

DRYDOCK AND ROUTINE REPAIRS: **U.S.S. Indianapolis** under overhaul from June 15 to September 11.

U.S.S. New Orleans scheduled for overhaul from September 1 to November 27.

UNITED STATES NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION: **CL41, Philadelphia,** L.B.P. 600′0″; beam 61′,7¾″; molded depth at side to main deck amidships 42′0¾″; draft corresponding to normal displacement 21′,8½″; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, **William J. Duane;** L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61′ 9¾″, depth molded at side to main deck amidships 42′0 3/8″, draft corresponding to normal displacement 21′10″; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS 179 Plunger,** keel laid July 17, 1935; launched July 8, 1936; estimated delivery Feb., 1937; **SS 180 Pollack,** estimated delivery May, 1937; L.B.P. 289′ 0″; beam 24′ 11-1/16″; loaded draft 13′9″; diesel electric engines.

Two 1400-ton submarines, SS185 Snapper and SS186 Stingray, order received from Navy Department September, 1935.

Port of Stockton Tonnage Gains 13 Per Cent Increase

Tonnage for the Port of Stockton was 13 per cent greater in July of this year than for the same month a year ago, this year's cargo tonnage aggregating 50,517 tons, with a value of $3,402,886, for the month.

The ocean terminal recorded 29,607 tons, against 20,910 tons for the shallow draft docks, B. C. Allin, Port Director, reported. The latter docks had their largest month in over a year and a half, owing to the return to service of river barges operated by Freighters, Inc.

Tonnage for the month of July was distributed as follows:

Inland, 22,867 tons; Atlantic intercoastal, 14,399 tons; coastwise, 10,971 tons; Gulf intercoastal, 1,500 tons; European, 750 tons; and transpacific, 30 tons.

Figures for the first seven months of the year show that the port's cargo volume reached 353,931 tons, the highest record for the period since the development of the inland channel.

Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ *By* BERNARD De ROCHIE, LOOK-OUT MAN

● New Union Oil Sales Manager

E. W. Hutton, for the past five years sales manager lubricants and special products, Union Oil Company, is resigning his post September 1 to associate himself with Refiners' Marketing Company.

The appointment of R. Cubicciotti to the position, effective September 1, was announced by V. H. Kelly, director of sales.

To his new position, Cubicciotti will bring sales ability combined with technical training. After his graduation from University of California in 1925 he worked as a chemical engineer until March 1926, when he entered the employ of the company as a refinery chemist. Within a short time he was made technical assistant to the manager of Oleum refinery. He became assistant foreman of the compound in 1930, where he gained a thorough understanding of lubricating oils and greases. Two years later he was transferred to the Los Angeles lubricating division. November, 1932, he joined the lubricating oil sales department at Hutton's request. During the past four years he has served as one of Hutton's assistants.

● Hunt-Spiller President

Victor W. Ellet has been elected President and General Manager of Hunt-Spiller Manufacturing Corporation, Boston, Mass., effective August 27, 1936.

Mr. Ellet was born in Burlington, Iowa, June 11, 1880. In 1886 his parents moved to Fort Madison, Iowa, where he was educated in the public schools, and Johnson's Business College. He later took the Railroad Engineering Course in the International Correspondence School.

Newly-appointed executives of Hunt-Spiller Manufacturing Corporation: (above) Victor W. Ellet, elected president and general manager and (below) Elbert J. Fuller, vice president and sales manager.

He served his apprenticeship as machinist with the Atchison, Topeka & Santa Fe Railroad at Fort Madison, Iowa, completing the apprenticeship in 1901.

After this time he worked for the St. Louis, Iron Mountain and Southern Railroad, Fort Worth, and Denver City Railroad, the old Choctaw, Oklahoma & Gulf Railroad now a part of the Rock Island Railroad, returning then to the Santa Fe at Fort Madison.

In 1905 he returned to railroad service as mechanical foreman on the Missouri-Pacific at Hoisington, Kansas.

In 1906 he entered the service of the Chicago, Rock Island & Pacific Railroad as an executive in the mechanical departments at Valley Junction, Fairbury, Nebraska; Chicago, Illinois; and Rock Island, Illinois.

In 1911 he entered the employ of Hunt-Spiller Manufacturing Corporation as Mechanical Representative, was appointed Sales Manager in 1925, Vice-President in 1928, and became President and General Manager August 27, 1936, succeeding John G. Platt.

Mr. Ellet is a member of the Executive Committee of the Railway Supply Manufacturers Association, is a member of the New England Railroad Club and other railroad clubs, a member of the Engineers Club at Boston and of the Charles River Country Club, of Newton, Mass., where he resides.

● Vice-President

Elbert J. Fuller has been elected Vice-President of Hunt-Spiller Manufacturing Corporation, effective August 27, 1936.

Mr. Fuller was born in Clinton,

Iowa, in 1883, where he was educated in the public schools.

At an early age he entered the service of the Chicago & North Western Railway Company as a machinists' apprentice at Clinton. On completing his apprenticeship, he remained at Clinton as machinist and later was appointed in a supervisory capacity in the mechanical department. During the years 1911, 1912 and 1913 he was Chief Inspector of new equipment for the Chicago & North Western Railway at the works of the American Locomotive Company at Schenectady.

He left the railroad service April 1, 1914, to enter the employ of Hunt-Spiller Manufacturing Corporation. He served as Mechanical Representative until his appointment as Assistant Sales Manager October 1, 1927, holding this position until March 21, 1928 when he became Sales Manager.

In addition to his present capacity as Vice-President, Mr. Fuller has been appointed Sales Manager.

● Fred Cordall Says He Can Prove It!

They'd tell you Oil and Water do not mix but Fred "Texaco" Cordall has been having no trouble. Formerly chief engineer on some of our biggest ocean-going wagons, Fred now lives, breathes and emasculates oil—'specially lube oil—as the marine sales expert of the Texas Company in and around San Francisco Bay

—with time out once in a while for Waltonian pursuits as witness his thirty-eight and one-half pounds white sea bass catch of the month, —to say nothing of his yellow-tail triumphs as pictured herewith, reading from left to right (as all good illustrations should) you see Freddy, the yellow-tail and the original Casey Jones of railroad fame.

J. F. Govan.

● Jack Govan Visits Us

An August visitor at P.M.R. offices was XZIT president, Jack Govan, out on the coast from New York headquarters to carry on the good work of eradicating soot in Pacific Ocean engine rooms.

Mr. Govan visited the George E. Swett Company offices while in San Francisco, which firm acts as sales agents for XZIT in this district. He was most enthusiastic over the splendid records reported by coast ship-operating lines in the use of the product.

Our candid-camera shot shows Jack alongside the desk of P.M.R. publisher Jim Hines.

● Annual Latin American Celebration

Latin Americans of San Francisco and the vicinity are preparing for their annual celebration commemorating the Independence of their respective countries to be held September 19th in the Gold Room of the Palace Hotel.

This Grand Ball and Dinner is the social event of the season among the Latin American colony and invitations have been extended to and accepted by many of the Consuls situated in this community.

Preparations have been under way for more than a month and the committee in charge has arranged a most entertaining program. A rhythmic tango orchestra will furnish the music for the evening and entertainment gathered from the different countries participating in the celebration will add the color necessary to make the affair one of gayety. The Misses Alida and Cecilia Morrice and their brother, Mr. Frank Morrice, will render dances from their native Panama and in addition to this there will be tall handsome girls modeling the latest fashions, garments for which have been supplied by the City of Paris.

It happened at Coronado Isles.
(See column 1)

The setting for this affair is being decorated and arranged by the Grace Line and promises to be a fitting background for so important an occasion.

Invitations may be secured by calling the committee in charge at the Palace Hotel.

● Bill Young Joins Travel Service

W. A. Young, Jr., our old-time friend of Pacific Mail, Panama Mail and Grace Line careers, and formerly General Passenger Traffic Manager of Grace at New York headquarters is announcing his association with the Albertsen Travel Service as vice-president effective September 1 with headquarters at 49 Geary Street in San Francisco.

William A. Young, Jr.

All of his old friends will join with us in wishing Bill Young the best of good luck in his new connection.

Sunday, August 16th, marked the resumption of the Chas. R. McCormick Lumber Company and the McCormick Steamship Company employees' picnic after a lapse of seven years. A group of more than 200 employees and their families attended the affair held at Oak Cove Park in San Mateo. Races, games, and dancing to a 10-piece orchestra were highlighted only by the drawing of many fine gate prizes.

Propeller Club of California to Resume Programs

President
JOSEPH J. GEARY

Secretary-Treasurer
STANLEY E. ALLEN

320 Market Street, Room 249,
San Francisco
Headquarters

Board of Governors

EDWARD H. HARMS, Chairman
H. H. BRANN
JOSEPH J. CONEY
PHILIP COXON
BERN DeROCHIE

L. M. EDELMAN
W. EDGAR MARTIN
GEORGE SWETT
CHARLES E. FINNEY
JOHN T. GREANY
C. M. Le COUNT
FLETCHER MONSON

Well sir — we'll be piping all hands back aboard the good ship in another week or two.

September 15 is the official date for resuming our semi-monthly luncheons and programs, and it's going to be pretty fine to see all the fellows again.

The luncheon program committee has engaged Captain W. J. Peterson, of the Pacific American Steamship Association, as guest speaker for the big day.

Captain Peterson will address us on: "Maritime Legislation Passed by the 74th Congress." The talk promises to be an authoritative analysis of new regulations governing our business of operating ships, and every man jack should want to get the speaker's message.

Secretary-Treasurer Stanley Allen announces the election to membership of Charles McCarthy.

—PC—

Golfers—stand by!

Your committee is making plans for the fall tournament. The boys are already in a huddle on "plots and plans," and full details will soon be released.

—PC—

Fine constructive programs are in the offing for the second lap of the 1936 voyage. The entertainment and luncheon committees have already built the September 29 program, with Warren H. Pillsbury, United States Employees Compensation Commission, addressing the Club on the subject: "Federal Interest in Maritime Accident Prevention."

Other authorities on their respective subjects will appear during the fall term, and we can look forward to some excellent programs.

—PC—

Notes from Stanley Allen — of a Personal Nature:

Jim Hines is back in town after an extended trip through the East. It is good to have Jim and his optimism back with us again.

A recent visitor in town was Captain Charles Sorley, one of our out-of-town members from Estero Bay; Charlie is enjoying a well-earned vacation.

Captain Alex Swanson is enjoying a well-earned vacation up in Mendocino County.

Jim Young and Wally Lafrenz just celebrated a dual birthday. How many years? Difficult to figure, as they are both well preserved.

Plans for Navy Day Observation are Launched

Present at the August 19 committee meeting making preliminary plans for the 1936 observance of Navy Day were: Walter J. Walsh, Chairman; Admiral E. H. Campbell, U. S. Navy; Captain Joseph V. Ogan, U. S. Navy; Captain L. M. Edelman, U.S.N.R.; Francis R. Shoemaker; Commander R. H. Booth, U. S. Navy; Captain C. C. McMillan, U.S.C.G.; Captain K. H. Donavin; Lt. Com. R. F. Skylstead, U. S. Navy; Captain Lewis Mesherry; Lt. S. J. Fass, U.S.N.R.; Ensign Phillip G. Lasky; Lt. Julian Ducray, U.S.N.R.; Lt. R. L. St. Clair, U.S.N.R.; Lt. C. A. Coggins, U.S.N.; Rudolph T. Haas.

Committee chairmen for the following cities were confirmed by the action of the group:

Lt. Com. Arthur C. Leonard, U.S.N. Ret., Riverside; Lt. Com. Lane Falk (M.C.), Eureka; Fred L. White, San Joaquin Valley; Leon Happell, Stockton; Loyal D. Mealer, Walnut Grove.

The suggestion was made that Lt. Lloyd Hugh, U.S.N.R. c/o Montgomery Ward Company, Oakland, should be asked to act as Chairman of the Day in Oakland.

Another suggestion was made that Robert Christie of the United Engineering Company, Spear & Folsom Sts., San Francisco, a resident of Alameda, be asked to serve as Chairman in Alameda; and a further suggestion for Alameda was James N. Eschen of Eschen & Minor, California Stevedore Co., San Francisco, also a resident of Alameda.

● Another P.M.R. Visitor

Mr. D. A. Beaton, first assistant engineer aboard the Washington, was in San Francisco for ten days visiting his family and as San Francisco is his home town, he has been very busy seeing some of his old friends along the waterfront.

We felt very much privileged at having a visit from Mr. Beaton and we know now one of the reasons why the engine-room of the Washington runs along so smoothly.

Notes by F. D. M.

We had a very enjoyable visit with **Warren G. Libbey,** exec of McCormick Steamship Company, at his new office the other day. Libbey is getting things in shape here, after eight years as South American manager for the company. He is assisting **J. A. Lunny,** vice president and director of operations, and will handle operations of the South American fleet.

He went to Buenos Aires in 1929, where he gathered a good deal of valuable information about conditions down there, returning to San Francisco in 1933 by plane. The trip was made up the East Coast to New York and across from New York to San Francisco, after which he returned via San Francisco to Valparaiso, then across to Buenos Aires, about 22,000 miles in all. While in Buenos Aires, Libbey was vice president of the Propeller Club in that city.

From 1917 to 1931 he was with Parr McCormick, then from 1921 to 1922 he went to a logging camp, where, according to a candid statement, he got a very thorough knowledge of lumbering, all the way from whistle punk to engine driver.

Last year, Libbey made a tour through Europe on business and pleasure, visiting a number of European ports.

The Pennsylvania recently took with her **L. E. Archer,** Pacific Coast passenger traffic manager of I. M. M. Company, bound for Acapulco to carry out a travel survey of Mexico.

W. H. Timberlake, for several years McCormick Steamship Company representative at San Francisco, has been transferred to Norfolk, Virginia, to take over the duties of general agent at the company's new agency. Offices will be located at Lamberts Point Terminal, and the ships will dock at Pier L.

Morgan Huntoon, Los Angeles district manager of Swayne & Hoyt, Inc., announces the promotion of **E. Bailey Cook** to chief clerk, succeeding **Russel W. Compton,** resigned; **Jack McLeod** to claim agent; and **Paul Chapman,** in the terminal staff at San Pedro, to McLeod's former post.

September 24 has been set for the annual golf tournament of the Pacific Traffic Association, at Millbrae Golf and Country Club. **Frank Herbert,** of the American - Hawaiian Steamship Company, is chairman, and a good time is promised to all who come. Admission will be $3.50, which, we hear, includes everything.

Captain A. Skjellerup, master of the Golden Cloud, is on leave of absence and vacation from his duties with the Oceanic & Oriental. He will probably return to his ship the early part of December. **Captain J. H. Berendsen,** former chief officer of the ship, will take command during the master's absence.

It seems that quite a number of our notes this month concern the Matson Line. Here are a few more we have for you. **C. Christian** is chief steward of the Malolo, having succeeded **C. A. Nelson,** transferred to the Monterey while the latter's chief steward, **S. Rose,** skips one trip for his vacation.

The Maliko is now commanded by **Captain B. V. White,** who relieves **Captain H. R. Gillespie,** assigned to command the freighter Matsonia. The Matsonia is returning to active service as a cargo ship in the California-Hawaiian Islands service.

C. E. Thomas, former Pacific Coast passenger manager of the Royal Mail Steam Packet Company, has joined the Albertsen Travel Service, after 11 years as manager of the foreign department of Cook's.

Captain John Gaylord Church, San Diego, U. S. N., retired, has been appointed by Governor Merriam as a member of the board of pilot commissioners for San Diego harbor, to succeed the late Rear Admiral H. A. Fields.

The new foreign freight agent at Vancouver for Canadian Pacific Steamships, Ltd., is **W. J. Furlong,** who succeeds **J. G. McNab,** transferred to the Montreal office.

Official opening of the San Francisco branch office of the Anchor Line at 467 Market Street brings us **Gordon Dekker** as San Francisco manager and **Perry Patton** as Pacific Coast passenger manager. Anchor Line operates the transatlantic cabin steamers Tuscania, Cameronia, Transylvania, Caledonia, and California, in weekly service between New York and Glasgow.

The Panama Pacific Line steamer California is under the command of Captain Theodore Van Beek, veteran transatlantic skipper, relief captain for the line. The change went into effect to relieve **Captain Robert A. Smith,** her regular commander, who is on vacation.

Captain Van Beek has visited the West Coast twice before as relief skipper, and always renews old acquaintances here, as he was a junior officer in Pacific service many years ago. His subsequent voyages took him all over the world, but he was mainly engaged in Atlantic service. When the California went on her round trip to Europe this year, she was commanded by him.

Like many other old salts, Captain Van Beek has a decidedly warm place in his heart for the Napa Valley region. He is a genial American citizen of Dutch ancestry, and speaks a number of languages.

Fred Ducato, F.T.M. of the Grace Line, has announced the appointment of **Frank J. Grace, Jr.,** to the freight solicitation department.

Young Mr. Grace is a scion of the family which gives its name to the Grace Line. He has had good experience on board the company's vessels and, more recently, in the company's shoreside offices in San Francisco. He replaces **Robert Elander.**

Bob Elander has been in the ship operating "game" for 23 years. He started when still in his teens at famous old Pier B in Seattle and is one of the valiant group of good old Pacific Coast Steamship Company days . . . the original Maltese Cross brigade. Many of his former coworkers—all Pier B graduates—are still following the sea and in ships. Paging Jim Cook, Lou Shain, Bern DeRochie, George Curtis, Myron Holzer, et al.

Tenth Annual International Lifeboat Race to be Run Septenber 12th

This Year's Classic to be Held off Brooklyn Shore

With a crew of the Norwegian American liner Bergensfjord entered in this year's running of the Tenth International Lifeboat race, to be held on Saturday afternoon, September 12th on a course paralleling the Bay Ridge, Brooklyn shore, one of the most thrilling contests for the Robert L. Hague world trophy is expected to result. It was the Norwegians who lifted the first cup offered for these annual lifeboat tests of stamina and speed with almost overwhelming victories. For the last several years they have had no crew entered in the race; their decision to again try for the new trophy was announced yesterday.

In addition to the Bergensfjord, John D. Reilly, chairman of the arrangements committee, also made known the other sure entrants in the coming race, which include boat crews from the following vessels:

W. C. Teagle (U. S.), Standard Oil Co. of New Jersey.

Veragua (U. S.), United Fruit Company.

Rex (Italy), Italian Line.

Normandie (French), French Line.

Queen of Bermuda (British), Furness Bermuda Line.

Two additional entries are expected to be made during the coming week, these being a crew from the new Cunard-White Star flagship Queen Mary and one from the North German Lloyd liner Europa, both of which have been training for some time in anticipation of being entered in the September race. It is also hoped that a crew from the laid up Shipping Board fleet will be represented when the starting gun is fired, making a total of nine crews who will face the starter at 2:30 P.M. Daylight Time, for the two mile dash and the hope of winning a leg on the coveted trophy, which has already been accomplished by the Italians and by the W. C. Teagle's crew. A challenge will be made to the winners of the Olympic barge race to race the winner of this year's lifeboat race.

The race committee have completed many of the arrangements for the event, Captain James F. Hottel, Division Commander of the U. S. Coast Guard, his Chief of Staff, Commander J. S. Baylis, Willard F. Jones of the Gulf Refining Company, Paul Revere Smith of the Roosevelt Steamship Company, Herman Esselborn and Captain Harold A. Cunningham of the Standard Oil Company of New Jersey, having already plotted out the course for the race, which will start below Fort Lafayette in the Narrows and end at a point off 73rd Street, Bay Ridge. With the committee on the occasion was City Magistrate Matthew J. Troy, chairman of the Brooklyn committee for the race, who is arranging for the erection of several large grandstands along the Bay Ridge shore, where the race may be viewed to great advantage, as well as the erection of loud speakers, through which will be amplified an intimate description of the event by experts.

At the finish of the race all of the entrants will parade from the finishing point, or rather their debarking point at the 69th Street Bay Ridge Dock, to the grand stand at 73rd Street, where Postmaster General James A. Farley will distribute the prizes to the winning crews, and where also will be present Mayor La Guardia, Police Commissioner Velontine and the Borough Presidents of Brooklyn, New York and Staten Island, as well as other City, State and Federal officials.

Plans for the event include arrangements for the handling of some 200,000 persons expected to view the race from the Brooklyn shore, as well as other thousands who, in numerous excursion boats and harbor craft, will follow the racing crews from the starting point to the finish line. The race will be held rain or shine.

R. Cubicciotti, who, September 1, becomes sales manager lubricants and special products department, Union Oil Company.

Captain Francis M. Edwards, assistant operating manager of Matson, is on a leave of absence, visiting Australia and New Zealand. **Captain Andrew Townsend** is taking his post.

Captain J. A. Russell has just been retired by Matson Navigation Company. Captain Russell served the Matson Line as stevedore foreman for many years. At the time of the Rio disaster, he was first officer of the ill-fated vessel.

● U.S. Fleet Week.

Portland's first annual Fleet Week, August 3 to 10 inclusive, was declared one of the greatest drawing cards the waterfront area of the city has ever had. Twenty-one naval vessels, headed by the heavy cruisers Houston, Chester, and Chicago, the hospital ship Relief, and the light cruisers Omaha, Detroit, and Milwaukee, were arrayed along the west side harbor wall and at various other berths close in. More than 100,000 people were estimated to have gone aboard the vessels.

Navy men, from Vice-Admiral W. T. Tarrant, commander of the scouting force, down to the galley crews, enjoyed the experience of walking ashore over gang planks and hiking only five blocks to reach the uptown area, rather than to taking the usual shore boat and street cars and busses to reach their destinations.

Necrology

On August 22, Reginald E. Cranfield passed away at his residence in San Pedro.

Mr. Cranfield was formerly with Shell Oil Company serving as marine superintendent from 1923 to 1929. He resigned from the Shell services three years ago.

The late Robert H. Swayne.

● Another Pioneer Passes

Robert H. Swayne, founder of Swayne & Hoyt, passed away on August 8, after an illness of several weeks. His death marks the passing of another of the old Pacific Coast pioneers, as Mr. Swayne was active in coastal and intercoastal commerce in the days when shipping had reached but little of its present development. In his time, the Panama Canal was opened, and Mr. Swayne was able to witness the increase of world trade to the Pacific Coast.

Mr. Swayne brought round the Horn the first steel ship to enter Pacific service, and was a leader in Coast affairs from the early days of pioneering and settling. Swayne & Hoyt is the result of his many years of activity in the field of commerce.

● "Joe" Barker Dies

It is with deep regret that we learn of the death of Joseph Barker, Matson Line's port engineer for 11 years, at his home in Napa. He had been retired since 1928, and was 66 years old.

"Joe" was always in the engine room of one of the Matson ships before his appointment as port engineer, having served as chief engineer for the Lurline, Rosecrans, Enterprise, W. S. Porter, Hilonian, Wilhelmina, Catanina, John A. Hooper, Californian, and Bowdoin. He was a good-hearted, energetic old veteran, whose hobby was hard work.

After retirement, Mr. Barker devoted his time to ranch life, into which he put the same driving force that was characteristic of his work on the pier.

● Matson Veteran Succumbs

The news of the passing of **Matt J. Lindsay,** freight traffic manager for Matson Line, reached us just after we had learned of "Joe" Barker's death. Mr. Lindsay died on August 18 at his home in Ross, where he had been living since his retirement about five years ago.

Entering the company when all its ships were under sail, he opened up the Baltimore office at the time Matson Line was operating between the Atlantic and Pacific coasts to Hawaii. Prior to this, he was with the old Oceanic Steamship Co. (Spreckels Line) until 1903, the date he went with Matson Line.

Lindsay was noted for his popularity among the rest of the old timers. He was president of the Record and Caribou Oil Co.; a former director of the Transportation Club of San Francisco; and a member of Islam Temple and the Jesters; Oriental Lodge 144, F. & A.M.; and the California Commandery. He was born in 1873, retired in 1931, and died at the age of 63.

● J. Harry Mull

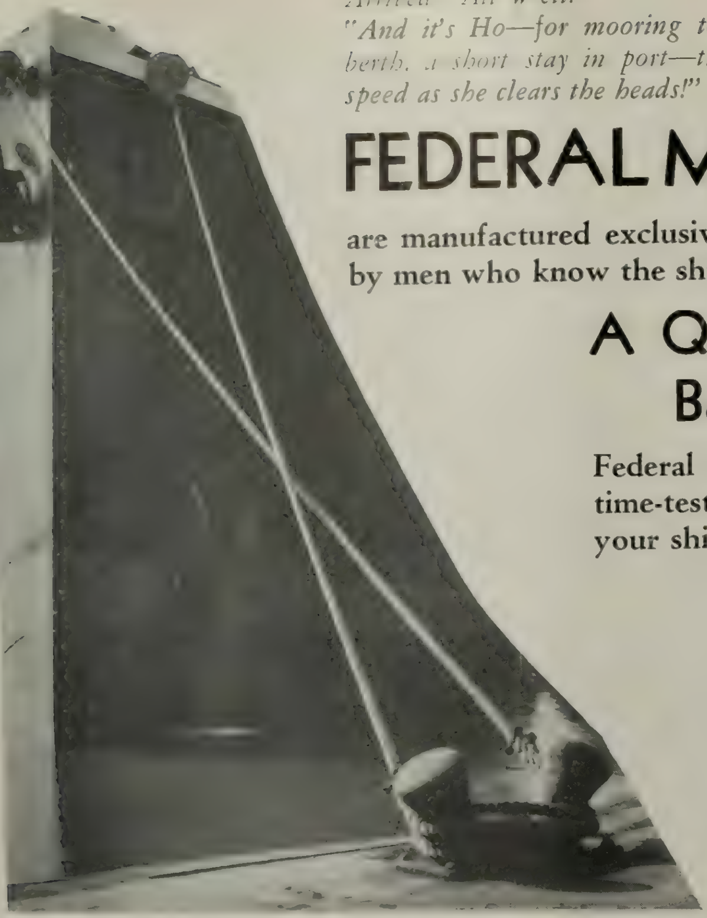
The death of J. Harry Mull, retired shipbuilder, marks the passing of one of the grand old men in the shipbuilding industry. Mr. Mull directed the William Cramp & Son Ship and Engine Building Company from the time of the World War until its closing in 1927. The yard had then been in business for almost a century, during which time it became one of the most well-known yards in the world.

Mr. Mull was born in Philadelphia, entering shipbuilding when 12 years of age. From then until his retirement in 1927, when he suffered a stroke after delivering the Malolo at Honolulu, the last steamship to be constructed by Cramp's, his career was one of consistent advancement. He went with the yard as a machinist in 1880, from which he rose to the office of president and general manager. He was in his seventy-third year, and was a member of numerous organizations.

● Captain John McClements

Another death we have to record is that of **Captain John McClements,** for the past four years San Francisco bar pilot. He was well known along the waterfront, and had followed the sea from his youth. His first command was the steamer Riva, a Pacific Coast vessel. Soon after, he joined the Dollar Line, where he served on a number of the line's early ships.

Captain McClements' appointment as bar pilot came in 1932, the appointment being bestowed upon him by the late Governor Rolph. He died at the age of 63.



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PACIFIC MARINE REVIEW

CTOBER
936

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PACIFIC MARINE REVIEW

OCTOBER, 1936
VOL. XXXIII NO. 10

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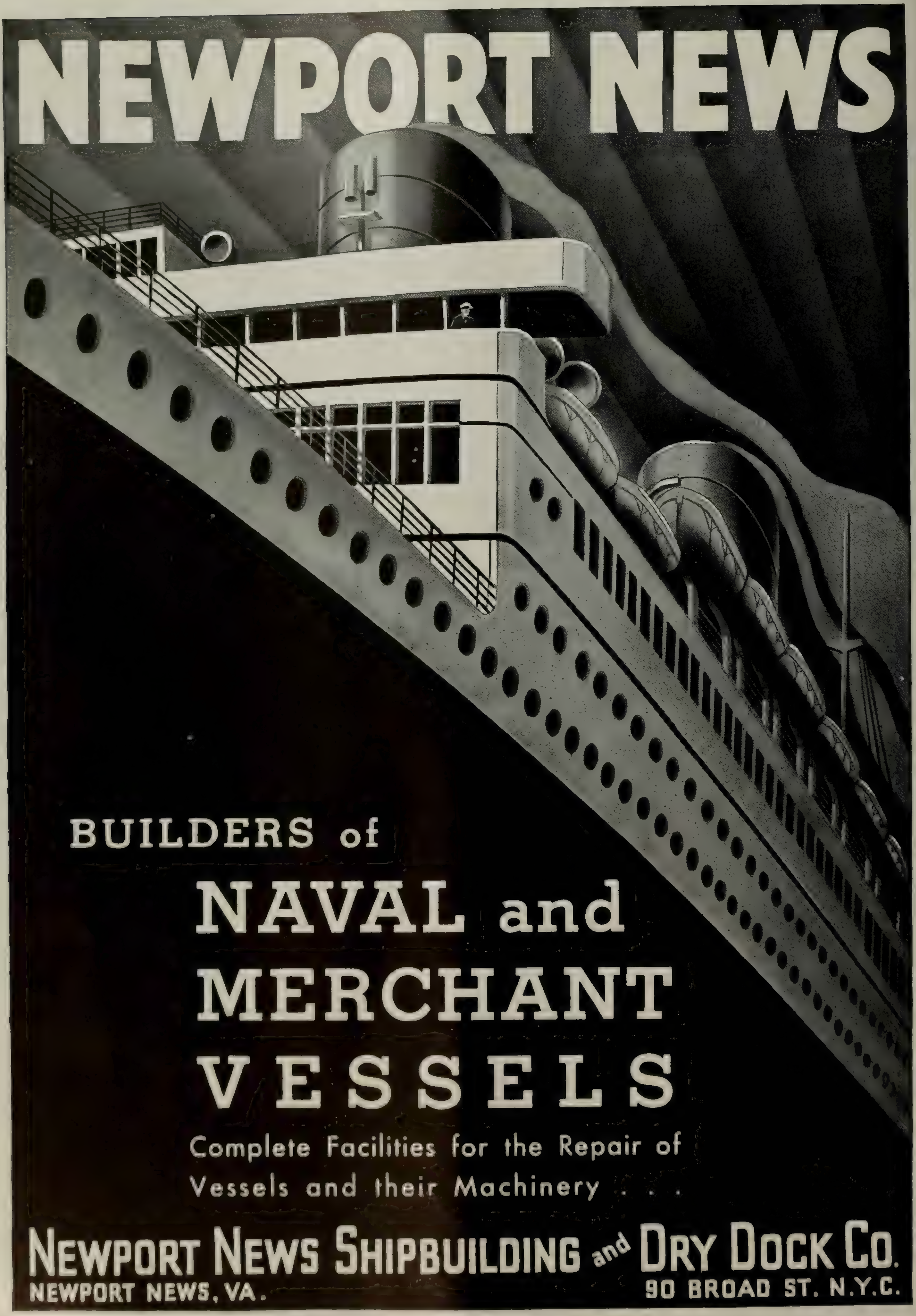

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PACIFIC MARINE REVIEW

VOLUME XXXIII OCTOBER 1936 NUMBER 10

Editorial Comment »« »«

Arbitration Necessary to Collective Bargaining

During the past two years, shipowners of the Pacific Coast, together with employers of waterfront labor at Pacific Coast ports, have been passing through experiences that have severely tested their morale.

Rights and privileges granted to maritime union labor by the award of October 1, 1934, have been daily, almost hourly, misused and abused by union labor to force almost unbearable conditions on the dock and on the ship. Maritime employers have patiently brought all disputes over these matters to arbitration, and have scrupulously followed out the findings of the arbitration awards, although these awards have frequently been adverse to their opinions.

These shipowners are to be congratulated that today, after two years of such experiences, they face the world with a greater solidarity of interest and of purpose than ever before in their history. Today the shipowners of the Pacific Coast and the waterfront employers of the Pacific Coast are united in a solid front in demanding that in every dispute between themselves and organized labor, the issues be submitted to an impartial board of arbitration, and that pending the decisions of such board, there shall be no interruption to the movement of ships.

This demand is so simple, so common sense, that it should appeal to every citizen as the correct solution for not only maritime labor difficulties, but also for all industrial or international disputes.

No matter what the dispute may have been, no matter how long, how costly, how violent, how fatal, the strike to settle it may have been—after all "the tumult and the shouting dies," a few men sitting quietly round a table must weigh all the evidence and decide the dispute on its merits.

How much better if all the energy and capital and life wasted in any strike had been put into constructive labor while a conference of unbiased, fair-minded arbitrators, after carefully and quietly considering all phases of the problem, decided definitely the best solution for all concerned.

If this be true for all industrial disputes, how much the more is it true when those disputes involve the industry of transportation, of which the merchant marine is an important unit.

The basic underlying consideration that must be the primary reason for the existence of an American or any national flag merchant marine is the safe and economical transportation of goods and passengers. Therefore there must be no stopping of merchant marine activities, merely because owners and their employees disagree. The only known methods for settling disputes between groups of individuals are Force or Arbitration. It is a matter of historical record that the use of Force is extremely expensive, and at the best only produces a temporary settlement. Arbitration, if carried out in good faith, is inexpensive and tends to permanency.

The Pacific Coast shipowners, in good faith and with great solidarity, have appealed to Arbitration.

Annual Book Drive for Seagoing Libraries

The Seamen's Church Institute, a Community Chest agency, announces its thirteenth annual Book Drive for the week of October 24-31. This drive, under the personal direction of C. C. Stevenson, Jr., president of the Board of Directors of the Institute, is to give the public an opportunity to donate books to be used in the seagoing library service.

These libraries are loaned to the crews of merchant ships, the vessels of the United States Coast Guard, and the ships in the Lighthouse Service; it is interesting to note that the New Haven carries a seagoing library on her trips to the supply stations of the flying Clipper ships. Seamen have varied tastes; hence all types of books are welcomed.

Your gifts of books may be left at any branch of the public libraries, or deposited in the collection boxes that will be found in many prominent places during the week of the drive.

Peace or War—We Need Ships

Confidently pessimistic, the one-man governments, with a quarter of the world's population, are doing their utmost to persuade themselves that their borders are in imminent danger of invasion, and if they don't do something to the "enemy" then the foe will surely think them afraid and will do it to them. It's the old story of aggressive nationalism, irrespective of its special color—"Do the other fellow before he does you."

In our own land we hear the warnings of experienced leaders who state plainly that America's best course is in being fully prepared for trouble. That trouble is not only expected, but is being courted in some sections of the globe, was seen in the utterances of Bernard Baruch, former chairman of the War Industries Board, and Brigadier General Henry J. Reilly, O.R.C., authority on international affairs and noted as a military expert.

Returning from abroad in August, Mr. Baruch declared that military preparedness would be not merely good insurance in view of world conditions at the moment, but if we should be forced into a defensive position, we would have to be able to give hard blows —and to land those blows FIRST. In his statement to the press, Mr. Baruch asserted that he found almost no desire for peace among the armed powers, but on the contrary, an attitude of defiance and even open challenges to combat.

General Reilly, in a masterly survey of the world military situation, was inclined to think that a war today would find all the participants completely devoted to the cause of their leaders. In other words, the nations at war would fight with everything at their disposal. More men would be on the firing line than was possible during the World War because more men would be freed from other activity for war purposes by the complete regimentation of the nations.

There is no doubt that our experience in the World War has taught us the value of adequate preparedness, especially in ocean transport. We are now building up our navy to treaty strength, but the auxiliary ships are still a matter of doubt. That is because shipbuilders and operators have not the definite assurance of our Government regarding the policy of the United States on the subject of federal aid to shipping.

The Government should make its position clear at once in a positive statement of policy what it plans to do about the matter. Shipping interests cannot launch a program of new construction or even of improvement on a year-to-year basis of aid because shipping is primarily a long-range enterprise. Moreover, the needs of a modern navy in the matter of auxiliary vessels are most exacting and the consequent investment of capital too large to risk on an indefinite promise of aid.

Whether the issue be one of peace or war, America needs modern, fast, efficient, and safe merchant ships. World competition, complicated by regimented labor of some nations in the guise of economic nationalism, makes it imperative for America to help the shipping industry. The Government is committed to such a policy, but it has taken too much time to put it into practice. The storm signals now flying in all ports of the world show that we have reached the point where a positive statement of policy is necessary for the safety of our commerce and the safety of the nation.

(Statement of the Middle West Foreign Trade Committee, as published in the Foreign Trade Merchant Marine News, September, 1936.)

International Meeting of Marine Experts

Two hundred naval architects and marine engineers from all parts of the world were guests of Rear Admiral George H. Rock, U.S.N. (retired), president of the Society of Naval Architects and Marine Engineers, at a reception held on September 14 at his home on the grounds of the Webb Institute of Naval Architecture, Bronx, New York. This reception and official welcome marked the opening of the International Meeting of the Naval Architects and Marine Engineers, the first international convention of its kind ever held in this country. Professional and social activities will extend over the entire week.

Among the internationally prominent guests of Admiral Rock were: The Right Hon. Lord Stonehaven, president of the Institution of Naval Architects; Dr. J. T. Batey, president of the North East Coast Institution of Engineers and Shipbuilders; Sir Arthur Sutherland; Dr. Franz Ott; Dr. Gunther Kempf; Rear Admiral Rolland Boris, French Navy; Maurice Bredeaut, of the French Departments of the Navy and Merchant Marine; Dr. Masawo Kamo, professor of mechanical engineering of Tokio University, Japan; and Dr. Renato de Santis, Italian Naval Architect.

Technical sessions opened on the morning of September 15 in the Sert Room of the Waldorf-Astoria, with the presentation of seven papers dealing with safety at sea and modern transatlantic liners. Dr. James Montgomerie, chief surveyor of Lloyd's Register of Shipping, presented a paper entitled "Safety at Sea," of which a full abstract appears in this issue of Pacific Marine Review. This was followed by a paper entitled, "Fire in Passenger Spaces," by E. Leslie Champness, managing director of Palmers Hebburn Company. A. B. de Berlhe, managing director of the Bureau Veritas, Rear Admiral Rolland Boris, and Read Admiral John G. Tawresey, discussed the subject of "Safety of Life at Sea." Sozo Ikushima, expert in The Mercantile Marine Bureau, Department of Communications, Tokio, Japan, read a paper entitled, "Some Observations on the Actual Applications of the Safety and Loadline Convention Rules."

Dealing with the subject of transatlantic liners, Fernand Coqueret and Paul Romano discussed "Some Particulars Concerning the Design of the Normandie and the Elimination of Vibration," and Ernest H. Rigg, naval architect of the New York Shipbuilding Company, presented a paper entitled, "Modern Atlantic Liners."

The following three papers were presented at the final technical session on the morning of the 10th: "The Rolling of the S.S. Conte di Savoia in Tank Experiments and at Sea," by Dr. Ing. Renato de Santis, of the Royal National Tank, and Dr. Ing. Michele Russo, of the Italia Steamship Company; "A Study of Ship Performance in Smooth and Rough Water" by Dr. Ing. Gunther Kempf, director of the Hamburg Model Basin; and "Power, Speed, Economy and Seaworthiness of Medium-sized Fast Liners," by Dr. Ing. E. Foerster.

Pacific Marine Review Twenty-Five Years Ago

Pacific Marine Review, First Established and only Exclusively Marine Paper Published on the Pacific Coast, appeared on October 20, 1911, from its office at 379-380 Arcade Annex, Seattle, Washington. Its masthead carried the names H. B. Jayne, editor, and Captain E. Francke, associated editor.

An interesting item declares: "San Francisco's recent primary election shows the parting of the ways from the old to the new. The perspicacity and perception its citizens have shown in selecting as the head of its municipal government, so capable, energetic, and well fitted a mayor, as we have all reasons to believe James Rolph, Jr., will make, is refreshing to note. We are satisfied and fully convinced that San Francisco's municipal affairs, with all its burdens, could not possibly be placed on stronger or more manly shoulders than those of its mayor-elect."

In a five-page article, the editor describes the formation of the Atlantic and Pacific Transport Company, then being formed by B. N. Baker and associates for the purpose of operating a line of passenger and cargo steamers intercoastal through the Panama Canal. A mail contract was being arranged.

The editor indulges in polemics against the editors of "Marine Review," of Cleveland, Ohio, and of Pearson's Magazine, for "applauding and supporting" the effort then being made by certain congressmen to legislate out of existence the preferential rebate system then effective in practically all steamship conferences, notably the Transpacific Homeward group. Says he: "We must try to regulate before we strangulate."

A consignment of six cars of silk, valued at $2,000,000, had arrived in New York on September 25 at 5·40 a.m., 97 hours and 40 minutes out of Seattle, via Chicago, Milwaukee, and St. Paul R. R.

U. S. Navy Department contracts had just been awarded for eight destroyers, none of which came to Pacific Coast yards.

The Union Iron Works, San Francisco, had recently been awarded a contract by the Oceanic Steamship Company for the overhaul and conversion to oil-burning of the steamers Ventura and Sonoma. Oil fuel tanks were installed of sufficient capacity to give a 10,000-mile cruising radius at service speed.

The Union S.S. Company of New Zealand had placed an order with John Brown and Company, Clydebank, for a new 10,000-ton steamer at a price said to be £335,000. This steamer was to have capacity for 7,000 tons deadweight of cargo, and for 300 first, 200 second, and 200 third class passengers.

The Hyades, of the Matson Navigation Company, was being converted into a molasses tanker at the Moran yard, Seattle.

The White Star liner Olympic, "largest and most magnificent steamship in the world," had just been involved in that famous mystery collision with the British cruiser Hawke, which was to form the basis for endless discussions as to the action and reaction of large ships passing each other in restricted channels.

Interesting ads from firms, many of whom are still in business, and not a few of which still advertise in Pacific Marine Review, include the following:

C. C. Moore & Company (Babcock & Wilcox Boilers);
Craig Shipbuilding Company;
Walker's Patent Ship Log;
Lidgerwood Manufacturing Co.;
Matson Navigation Company;
American-Hawaiian Steamship Company;
Goldschmidt Thermit Company;
Fireman's Fund Insurance Company;
Johnson and Higgins;
Hind Rolph and Company;
Union Iron Works;
Fore River Shipbuilding Company;
Mitsui and Company.

Scotch Shipbuilders' Conservatism

The British press is chuckling over the annual report of John Brown and Company, Clydebank, the great Scotch shipbuilders. All that this report has to say about the splendid work accomplished in the construction and equipment of the great Queen Mary is in this one small paragraph:

"R. M. S. Queen Mary was handed over to Cunard-White Star, Ltd., on May 12. The results of the trials exceeded the expectations of the board: Sir Thomas Bell, Mr. S. J. Pigott, and the staff and workmen at Clydebank are to be congratulated on this achievement."

Less than fifty words (minimum rate for a night letter) to dismiss the world's greatest ship and their own greatest achievement.

Well these Scotchmen can afford to be splendidly reticent. Their product speaks for itself.

"Old Genuine" Retires

ALEX SWANSON

Alex Swanson, dean of the San Francisco Bar Pilots, having resigned after 46 years of faithful service, his fellow pilots gave a luncheon in his honor, at which a representative of Pacific Marine Review was among the invited guests. So impressed was our reporter with the simple sincerity of this grand old character, whom "to know is to love," that he broke out into verse:

To Alex Swanson

A Master Pilot

★

What a record of Service! Through forty-six years,
With no asking of favors, no waiting for cheers,
You piloted ships. Craft of every sort,
You brought them all safe into "Frisco's" fair port.

Virtue and praise in all contacts you sought;
Envy and malice were ne'er in your thought;
Pilot were you not only to shipping,
But to many a comrade whose moorings were slipping.

Your charm as a friend is never done;
Your smile and your handshake are all in one;
To make each day brighter—easier to live—
What courage—what faith your example doth give.

Now snug and secure in your lovely ranch home,
Just remember, when seaward your heart desires roam
To your loved Gracie S. and The Potato Patch,
That for you our heart doors have no lock and no latch.

Safety at Sea*

By J. Montgomerie, D. Sc.

Chief Ship Surveyor, Lloyds Register

In recent years the term "safety at sea" has been associated almost exclusively with the watertight subdivision of vessels. It is in reality, as all will agree, of much broader scope than that. It covers the entire art and practice of ship design and embraces every variety of floating structure on which man adventures his life or his substance on the water. There is an endless process of trial and error, of compromise between things desired and results to be avoided, that constitutes the practice of the naval architect of today.

Safety at sea was the first question dealt with by the British Institution of Naval Architects at their opening meeting in the year 1860. Two papers were read on the "Strength of Iron Ships," a subject then in its infancy. In 1866 the same authors contributed papers on the "Security of Iron Ships," having reference to recent losses at sea. When these meetings ended, Mr. Scott Russell and Mr. E. J. Reed were responsible for the following resolution which was adopted:

"That in the opinion of the members and associates of this Institution, it is desirable that an early meeting of the Council take place, for the purpose of considering, with reference to the President's opening speech, and to the papers that have been read on the security of iron ships, what recommendations could best be offered to the public, in order to prevent as far as possible the loss of passenger and other vessels."

That resolution led to a close investigation of the whole subject by the Council, who formulated a series of recommendations from which I summarize the following:

1. **Dimensions.** No general rule can be laid down for proportions of length and depth to breadth.

3. **Freeboard.** It is desirable that a minimum freeboard should be fixed.

4. **Poops and forecastles.** Not considered desirable to offer any recommendations regarding provision of poops and forecastles. In general, spar decks are to be preferred to poops and forecastles.

5. **Compartments.** No passenger ship is well constructed unless she will float with one compartment open to the sea and it is very desirable she should float with two adjacent compartments open.

7. **Hatchways.** It is desirable to carry the beams of the ship across the hatchways without interruption wherever practicable — the beams may be removable where required, being replaced on going to sea. Engine and boiler casings should be as high as practicable and be securely attached to the deck.

8. **Side scuttles.** Should be provided with hinged deadlights.

10. **Pumps.** Recommendations made regarding pumping arrangements.

These recommendations formulated in 1867 do not differ materially from accepted canons of practice in modern times. Seventy years ago naval designers were concerned with the relations of the principal dimensions, with minimum freeboards, and with watertight subdivisions just as they are today.

● Relative Dimensions and Safety

In 1891 Mr. Benjamin Martell, chief surveyor to Lloyd's Register, made an investigation of the effect on safety at sea of the relations of the principal dimensions to each other. Prior to that time there had been what amounted to more than a suspicion that the small ratio of beam to depth produced definitely unsafe conditions in ordinary sea service. It was found, for example, that from 1875 to 1885 there were on the British Register on the average about 450 3-deck vessels afloat in which the proportions of beam to depth were such as to justify him in calling them "narrow." Out of these, in those eleven years no less than 75 were returned as missing or foundered, a loss of 16.6 per cent from these causes. During the same period the number of well deck vessels, a type of greater relative proportion of beam to depth, had risen from 430 to 1400. The total loss (foundered or missing) of vessels of this type amounted to 49; i. e., about 6 per cent or roughly one-third of those of the narrow 3-deck type. He also found that a large proportion of the losses occurred in ships carrying coal, grain, or ore—a distinction which is still painfully evident today.

Those who laid the foundation of shipbuilding, to whom more credit is due than is sometimes admitted by posterity, thought of safety at sea in a broad and sensible way.

In 1906 the British Freeboard Regulations were revised—one of the most drastic revisions in the history of freeboard assignment. It was computed at the time that the deadweight carrying capacity of the world's tonnage had been increased by 500,000 as a result of the deeper loading permitted and public thought was directed with great intensity to the question of safety. After nine years' experience an investigation was made of the effects of the new legislation. The average annual loss of steam vessels for seven years prior to 1906 was one in 335 or 0.30 per cent. For the seven years after 1906 the average annual loss was one in 371 or 0.27 per cent. The Government Committee which made the investigation came to the conclusion that the increased immersion had not prejudiced the safety of vessels and had not been responsible for any increase in insurance premiums. The increased safety of ocean-going ships as represented by the figures given above has been maintained and increased to our own times. Thus, from figures published by Lloyd's Register of Shipping for the years 1930 to 1934, the average annual loss of British steam and motor vessels reported "Abandoned, Foundered, or Missing" was one in 753 or 0.13 per cent. Table I gives particulars of these losses since 1894.

---

*[Abstract of paper presented at international meeting of The Society of Naval Architects and Marine Engineers, New York, September 15, 1936.]

Table 1.—British Sea-Going Steamers and Motorships of 100 tons gross and upwards reported Abandoned, Foundered, or Missing (1894-1934)

	Average Annual number of ships lost	Average total number owned	Percentage lost
1894-1898	22	6543	0.34
1899-1903	23	7198	0.31
1904-1908	22	8074	0.27
1909-1913	21	8481	0.25
1925-1929	14	7908	0.18
1930-1934	10	7533	0.13

The particulars given in Table I apply to British vessels, these being obviously easy of access for the writer. It will interest you, perhaps, to have some relative figures applying to your own ships. In Table 2 are some figures taken from the statistical records of Lloyd's Register showing the number of American sea-going steam and motorships of 100 tons gross and above which have been similarly lost at sea. The percentage loss is less than the British figures, but keep in mind the difference in the number of ships and the conditions of trading.

Table 2.—United States Sea-going Steamers and Motorships of 100 gross tons and upwards reported Abandoned, Foundered, or Missing (1894-1934)

	Average Annual number of ships lost	Average total number owned	Percentage lost
1894-1898	1.2	686*	0.18
1899-1903	1.8	739	0.25
1904-1908	1.8	1030	0.18
1909-1913	1.4	1166	0.12
1925-1929	3.8	3093	0.12
1930-1934	2.6	2698	0.09

*Includes ships operating on the Great Lakes.

The safety of small vessels is not governed by the same considerations as affect vessels of average size. Their construction, often embodying hatchways of relatively large size, their low freeboard, and the nature of their service expose them to dangers from some of which their larger sisters are immune. An examination of the loss statistics of vessels under 1500 tons gross for the five years 1921 to 1925 was made for the committee of Lloyd's Register. During this period, 44 British vessels were lost out of 1365, or one in 155 or 0.64 per cent per annum. This rate of loss is about three times that of the average, and it is significant that two-thirds of the lost vessels were at the time of the casualty carrying cargoes with a tendency to shift, such as coal or ore.

A curious and notable fact about these casualties is that there seems to be a much greater rate of loss in vessels of a lesser age than in the older ships. Thus out of 240 vessels under five years of age, 16 were lost, or one in 75 or 1.3 per cent per annum. We are familiar with the phrase, the dangers of adolescence—as often applied to humanity. Table 3 shows in a graphic manner those which attend that period in small ships. The figures refer to steel and iron steamers and motorships of sizes from 100 to 1500 tons gross registered in the United Kingdom and engaged in ordinary sea trading.

Table 3

Divisions of age (years)	Total number of vessels	Number reported abandoned, foundered or missing
Under 5	240	16
5 and under 10	260	2
10 and under 15	157	4
15 and under 20	171	6
20 and under 25	182	2
25 and above	355	14
Totals	1365	44

We have been considering the progressive achievement of greater safety for ships as represented by the figures showing losses at sea, and it seems logical to inquire now: What are those factors which are concerned with the safety of a ship at sea? It is possible

Transpacific cargo and passenger liner President Hoover.

here to generalize a little and to group these as follows:

1. The strength of the steel structure considered as a whole and in detail.
2. The geometry of the structure, which without stretching the point too far might be held to include stability, freeboard, and internal subdivision.

● Strength of Structure

The strength of the structure of ocean-going ships, considered as a whole, is almost entirely governed by the rules of the various classification societies. These rules are the result of a long process of what may be called elimination of redundant parts.

It is to be remembered now that that process has apparently reached its limit, and that any further lightening of the structure will be effected on its fundamental elements. I do not say this is impossible but it is important to remember the distinction that exists as between possible reductions of scantlings now and those which were effected formerly, a distinction that seems closely allied to safety.

The general arrangement of scantlings as one sees it today has proved itself sound. This applies to all cargo vessels and to tankers. Certainly we have records of very severe damage to cargo vessels, damage which has put the ship in great danger, but these have all taken place in exceptionally severe weather conditions and abnormal distribution of cargo or ballast.

There are no printed rules for the construction of very large passenger vessels. The distribution of material depends on the accumulated experience of the owners, builders, and of the classification society concerned, and the general practice can be described as satisfactory. There is one point, however, which, as a matter of personal opinion, I venture to bring forward. It is fairly common now in this class of vessel to have divided uptakes, the advantages of which are obvious from the point of view of arrangement.

I do not agree, however, with the concentrating of heavy material at the middle line on the deck at a maximum distance from the web of the girder, that is, the side plating, when there is no practicable means of making it effective as a part of the general strength of the vessel. The material concentrated there would be better employed if placed at the sides of the vessel and would lessen the chance of damage to decks.

There are two things on which the safety of the structure, otherwise sound considered as a whole, mainly depend. These are the protection of openings and the steering arrangements. Recent events have directed attention to the security of the hatchways and the efficiency of the steering gear. Official inquiries held in London last year show that the S. S. Millpool sank with all hands in the North Atlantic in October, 1934, and messages received from her indicated that her after hatch was stove in. The S. S. Blairgowrie was lost in the North Atlantic in February, 1935, and her wireless messages bear that her steering gear had broken down and that Nos. 1, 2 and 5 hatchways had been breached. The S. S. Usworth was abandoned in the North Atlantic in December, 1934, due to failure of steering gear followed by the entrance of the sea into No. 2 hold.

It is the rod and chain type of gear that is chiefly criticized, and certainly it is a type of gear that demands for its efficiency the most particular care in maintenance. Given that, however, this gear is satisfactory. It can be proved that accidents to steering gear do not occur with a greater frequency than casualties to other parts of the ship's equipment, but it is to be remembered that a breakdown of the steering gear may involve consequential loss of a serious character.

It is a fact that may occur to a layman as curious that, although for the last 40 years the size of hatchways in cargo vessels has progressively increased, the method of making them secure against the assaults of the sea has not been substantially altered. The strength of the hatchway coamings has been increased, but the opening is still closed in with pine covers protected by tarpaulins, secured by lashings. It does seem that the time has come when more serious attention should be given to the various proposals, such as the adoption of steel covers, which have been made to obtain an increased measure of protection for these openings.

In considering these matters the naval architect has a difficult task given to him. He has to take account of the public outcry which a series of disasters at sea always brings in its train, and at the same time he has to design his ship on a basis of economy in construction and operation, and he knows besides that situations develop at sea, rarely it is true, which seem to defy human care and ingenuity.

In December, 1934, a ship was proceeding from Europe to Philadelphia with a cargo of pig iron when an exceptionally heavy sea burst the front of the saloon house. The captain and chief officer, who were sitting in the saloon, were instantly killed and the wheelhouse above was carried away, and with it the third officer. This illustrates the incalculable element or factor in the problem of safety. A photograph of the damage sustained to this ship shows that the front of the deck house was torn completely away from the deck above and was laid almost flat on the deck, while the flying bridge has been completely carried away.

Protection of the engine room is another important component of the ship's safety. When tanker freeboards were revised in England and made statutory in America it was universally agreed that a necessary condition should be the effective protection of the machinery openings. The Load Line Convention in fact requires that machinery casings are to be protected by a closed poop or bridge, or by a deck house of equivalent strength. In general, modern provisions for these parts and for the construction of ventilators and other deck erections are entirely satisfactory.

● Geometry of Structure—Stability, Freeboard, Subdivision

A. Stability. At a first glance it is erroneous to associate stability with geometry without qualification, for it is governed by the nature and character of the cargo, over which the designer has no control. Apart from that, however, and assuming uniform loading or known loading, the problem is to produce a margin of stability which in the given circumstances shall be neither too great nor too small. There are so many considerations affecting this that it is difficult to find a basis on which one can illustrate the development that has taken place. Other things being equal, the ratio of breadth to depth can be regarded as a suitable basis. In 1870 an average value for this ratio was approximately 1.30, in 1879 it was 1.40, and in 1890 was 1.50. It is a little doubtful if this progressive increase of breadth proceeded from an altruistic desire to build safer ships; its more authentic origin was the wish to obtain increased capacity by increasing the breadth—the most economical method of achieving this object. The proportions of breadth to depth today are, for normal cargo vessels with 50 per cent of their length covered by erections, 1.70. For vessels with complete superstructures an average figure is 1.50.

This ratio, considered as a standard of safety, is of importance for small coasters. These vessels frequently carry coal or other similar cargoes which are liable to shift in heavy weather. Following upon the loss of several of these vessels, an informal committee in England investigated carefully all casualties to coal laden ships which had occurred in the previous 26 years. They reported that it was generally recognized that for safety such vessels should have, when loaded, a certain minimum proportion of breadth to summer draft. This will vary with the size of the vessel, and they recommended the proportions in Table 4. In my experience these figures are generally exceeded.

Table 4.—Minimum Proportions of Breadth to Summer Draft

Breadth	Normal vessels with double bottoms, proportion breadth ÷ draft	Normal vessels with single bottoms, proportion breadth ÷ draft
20.0	2.240	2.17
25.0	2.150	2.09
30.0	2.090	2.04
35.0	2.054	
40.0	2.030	
45.0	2.010	

The International Convention for the Safety of Life at Sea, 1929, requires that every new passenger vessel is to be inclined and the necessary information regarding stability given to the ship's staff.

B. Freeboard. The height of side out of the water vitally affects the safety of the ship. The amount of freeboard is a measure of the range of the curve of stability, it is a measure of the percentage of reserve buoyancy, and it fixes a minimum height of platform. In 1835 the committee of Lloyd's suggested a freeboard equal to 3 inches per foot depth of hold, which no doubt was a reasonable interpretation of the practice of the time, bearing in mind the uniformity in design of the ships then built. Other rule of thumb methods were proposed by other interests, and the first compulsory load line in England was required by an act of 1876.

Freeboard was made a condition of class by Lloyd's Register for vessels of the awning deck type in 1873—the first instance of a loadline being required by a public body. In 1882, a report was submitted to the committee of Lloyd's Register accompanied by tables of freeboard prepared from evidence accumulated by the staff. These tables formed the basis of the first tables issued by the Board of Trade in Great Britain in 1886, and constitute the foundation on which the whole structure of modern freeboard regulation has been built.

Since 1886, we have seen a simple but progressive reduction in freeboard in ships of all sizes—a reduction which, however, it is important to note has been accompanied by an increasing stringency in the regulations governing the conditions of assignment, which represent a higher standard of safety in respect of the protection of the vital openings of the ship.

This comparative uniformity may be taken as presumptive evidence that modern freeboard assignment is at least based on an experience which is satisfactory. There may, however, be a qualification necessary in respect of smaller ships of the coasting class. In the winter of 1925-26 a small tanker 120 feet in length was lost in the Bristol Channel in heavy weather. The winter freeboard was 9½ inches from the top of the steel deck, and there was a continuous trunk fitted between the forecastle and the engine casing. It looked one of the safest small ships that could be designed. The vessel was lost, however, not primarily because of the low freeboard but because water was trapped between the side of the trunk and the high bulwark. It was a case that showed clearly the vital necessity for getting rid as quickly as possible of water falling on deck.

Six years ago representatives of the nations were gathered together in London to agree and determine the basis of loadlines which should be accepted internationally, and one most important part of their work was the determination of an international loadline for tankers. To this conference the American delegation brought experience of great importance. Up to that time there had been no statutory loadline for ocean-going ships registered in the United States, and the proposals put forward by that delegation were considered to represent safe American practice.

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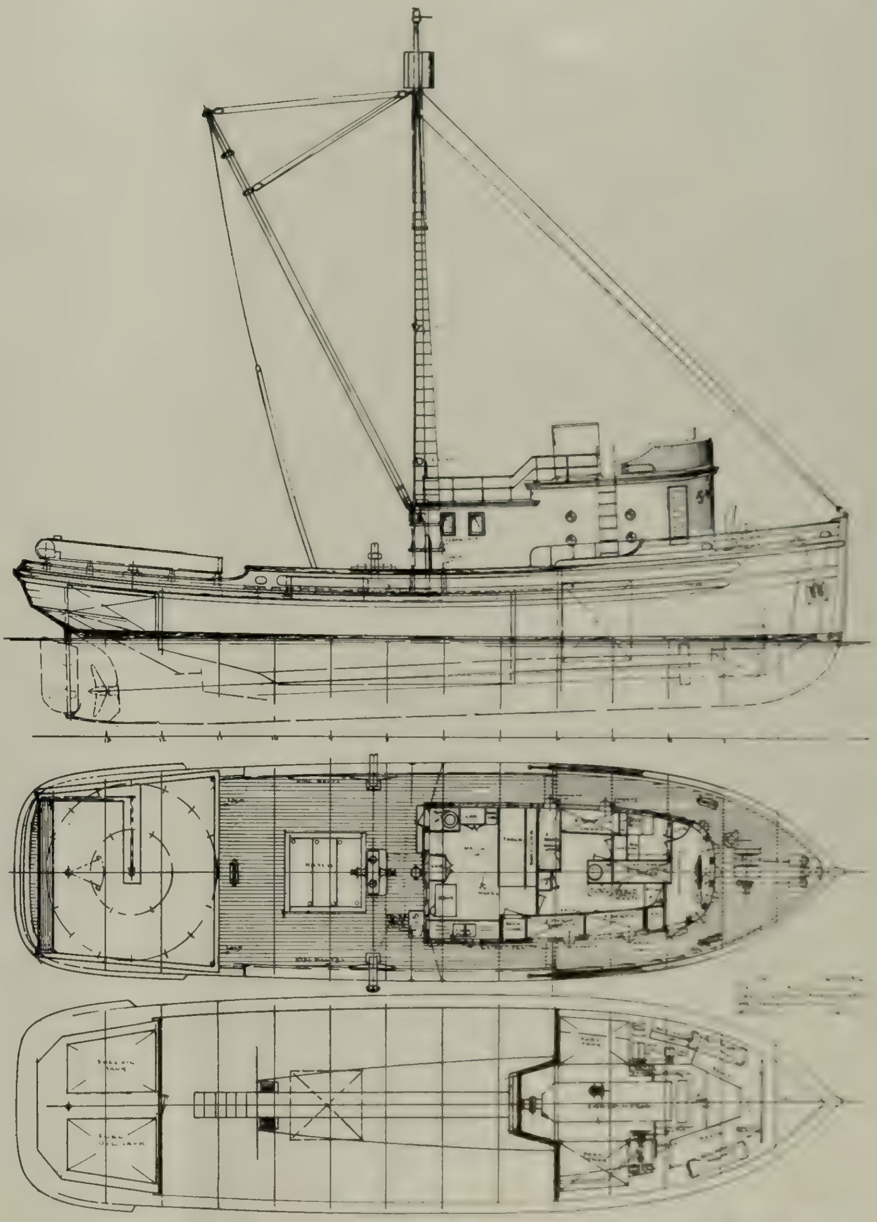
Table 5.—Statement Showing the Effect of Changes in the Board of Trade Regulations on the Summer Freeboard of Ships

Molded dimensions of ships, feet	Year Built	Percentage Covered by erections	1886 to 1903 Rules	1906 Rules	Convention 1932
135 x 21 x 10.5	1899	57	0′ 10½″	0′ 9¼″	0′ 11″
142 x 23.5 x 12.92	1890	72	0′ 9¾″	0′ 7″	0′ 5¾″
153.1 x 25 x 12.17	1902	75	0′ 8½″	0′ 5¼″	0′ 4¾″
187 x 31.4 x 19.58	1875	17	3′ 5¾″	2′ 5¾″	3′ 6½″
215.58 x 31.82 x 16.33	1900	70	1′ 4½″	1′ 1½″	1′ 0¼″
230 x 33 x 17	1899	69	1′ 7″	1′ 4″	1′ 2¾″
240.66 x 35 x 17.75	1903	89	1′ 4¾″	1′ 3½″	1′ 3″
241 x 34.8 x 17.5	1889	69	1′ 8½″	1′ 6¼″	1′ 5¼″
[illegible] x 36.4 x 22.54	1883	45	3′ 6½″	3′ 5½″	3′ 5″
302.8 x 45.3 x 22.33	1902	44	3′ 5¼″	3′ 4¼″	3′ 5″
310 x 44.8 x 22.83	1905	80	2′ 10¼″	2′ 7½″	2′ 5¼″
315 x 46.5 x 23.15	1903	80	2′ 10″	2′ 6½″	2′ 3¼″
[illegible] x 46.18 x 25	1899	45	4′ 2¼″	4′ 1″	4′ 1″
325 x 46.8 x 24.83	1902	45	4′ 4″	4′ 3½″	4′ 3″
[illegible] x 47.8 x 24.52	1902	70	3′ 6¾″	3′ 4″	3′ 3½″
350 x 51.75 x 26	1903	100	3′ 3½″	2′ 8″	2′ 6¾″

Pacific Coast Fishing Boats

Some Notes on the Remarkable Progress made in the Boat Building and Engine Building Industries, with Particular Reference to "Purse Seiners" and Tuna Clippers



Outboard profile, deck plan, and hold plan of typical Puget Sound purse seiner. Kingfisher, built by Western Boat Building Company, Tacoma. 86'x20', 240 horsepower diesel engine.

The Pacific Coast of the Americas is one of the world's great sea fishing grounds. Close in, coastwise sea fishing had been practiced by the Indian tribes all along the Pacific shore from Behring Straits to Cape Horn. Early Spanish settlers encouraged the Indians in this industry and provided them with a few new ideas in gear and methods.

In California, Oregon, and Washington, sea fishing had considerable attention from settlers in pioneer times, and Chinese, Italian, and Portugese fishermen soon began net fishing, first on the beach and then from boats. The majority of the first commercial fishing boats were of the Italian felucca model with lateen sail rig, from 24 to 32 feet long, with a finely modeled clipper bow and a whaleboat stern. Up to the last decade of the 19th century, such boats were the rule.

Then began the introduction of motor power. Gasoline engines gave a wider sea range, a more certain and faster run back to port. Keener competition became possible. Canning of various types of Pacific Ocean fish became a commercial business on a large scale. Fishing soon became a standardized scientific commercial business that demanded bigger and better equipment.

Two special Pacific Coast types have evolved from these demands. They are known as "purse seiners" and "tuna clippers." A swift summary reveals in broad general outlines the history of these two types.

In 1900 the majority of the boats used in purse seine operations were rowboats worked from a floating barge. All the heavy work of the net hauling and brailing was done by hand. About that time there was built the first gasoline engined seiner, about 32 feet long and powered with a heavy duty, one-cylinder, 5-horsepower motor. This model became very popular at once and quite a number were built. It was a natural step to install a power drive for the net winch. This at first took the form of a mechanical connection to the main engine shaft, with clutches for engaging or disengaging the drive. Quite a few fishermen still prefer this type, and considerable design work has been expended to

get more effective clutches and more efficient gears in the assembly of such drives. The largest and newest boats today are using electric power for the auxiliaries.

The next improvement in purse seiners was the adoption of the turntable for handling the net. This table is mounted on rollers at the extreme after end of the deck and is arranged with a large roller at its open side. This side is aft when the net is being laid out over the stern for a "set," and is turned to the side of the vessel when the net is being hauled in with the catch. As it is hauled in, the net is emptied and is laid out on the turntable in orderly shape for the next cast. The open side of the turntable is then turned aft and everything is ready for another set.

Then came the idea of the mast and boom for getting better purchase on the weight of the lead line and net when hauling in; then a brailer for lifting the fish from the net more easily and more quickly.

The next great improvement was substitution of the diesel engine for the gasoline engine. Before we make this substitution, let us pause a moment to pay a well merited tribute of praise to the heavy duty marine gasoline engine designers and builders of the Pacific Coast.

This type of engine was originally developed in San Francisco, and the first successful marine gasoline engines were built right here. The pioneer work of Union, Standard, Atlas, Hercules, and Hicks gasoline engine companies made possible all these early developments in the fishing boats of this coast. The majority of these engine builders turned to diesel engine design and manufacture when that more economical form of internal combustion motor had demonstrated its reliability at sea.

Purse seiner Diana built by Al Larsen of Los Angeles, 78′ by 20′ by 10′6″, 180 horsepower Atlas Imperial diesel engine.

Their experience with heavy duty marine gasoline engines enabled them to produce practical rugged diesel units especially adapted to the needs of the Pacific Coast fisherman. When the fisherman was ready for the change to diesel power, he found his favorite gasoline engine builder ready to install a diesel bearing a name that carried to the fisherman's mind a guarantee of satisfactory performance.

The bulk of the early development of this type took place in and around Puget Sound and was mostly, at first, confined to the Puget Sound salmon fisheries. About 1915, the boats had arrived at a fairly standardized rig, as above outlined, with 55-foot length as about the upper limit. At this time some of the Puget Sound purse seiners began to operate north along the coast and up into Alaska. Soon the advantages of the purse seine method were applied to Alaska herring and other fisheries. About this time also, the idea began to move south to the California fisheries for sardines, tuna, skipjack, bonita, barracuda, mackerel — in fact, any fish that schools.

Very rapidly now the size of boats increased, and there is now a large Pacific Coast fleet of them ranging from 50 to 100 feet in length, with engines up to 350 horsepower.

Along with the larger size and more powerful engines came the demand for equipment, and in the larger boats we find such items as: Oil or gas burning galley ranges; mechanical refrigeration for food supplies and fish cargo; radio telephones, radio automatic steering, and radio receivers for broadcast programs; and fathometers for automatic soundings.

Hervey M. Petrich, of the Western Boat Building Company, Tacoma, which firm has recently laid down

Photos by Frank Wheeler

Above: A recent view of Fisherman's Wharf, San Francisco, showing many fish boats in the slip. On facing page the fleet of purse seiners in Monterey Harbor.

the keel for its Hull No. 120, is an authority on purse seiners. Says he in a recent article in the "Pacific Fisherman":

"Tested and proved from Bering Sea to the coast of South America, the purse seiner is accepted as a most efficient means of catching any species of schooled fish. Looking back to the oar-driven skiffs of the nineties, or even the 32-ft., 5-hp. boats of thirty years ago, the evolution of this type of craft has been amazing in both rapidity and extent.

"Today there are many hundreds of purse seiners operating in Alaska, British Columbia, Washington, Oregon, California, and Mexico. Some of the modern vessels are designed for constant year-round service in all waters: following the seasons for fish of various kinds from Alaska to Lower California, or even south to the equator. Soviet Russia is now adopting this system of fishing, as well as fishermen in Jugoslavia and Italy. Soon, also, we shall see these trim vessels make their appearance on the east coast of the United States, to supplant the antiquated methods hitherto used in the menhaden and other fisheries of that district."

● Tuna Clippers

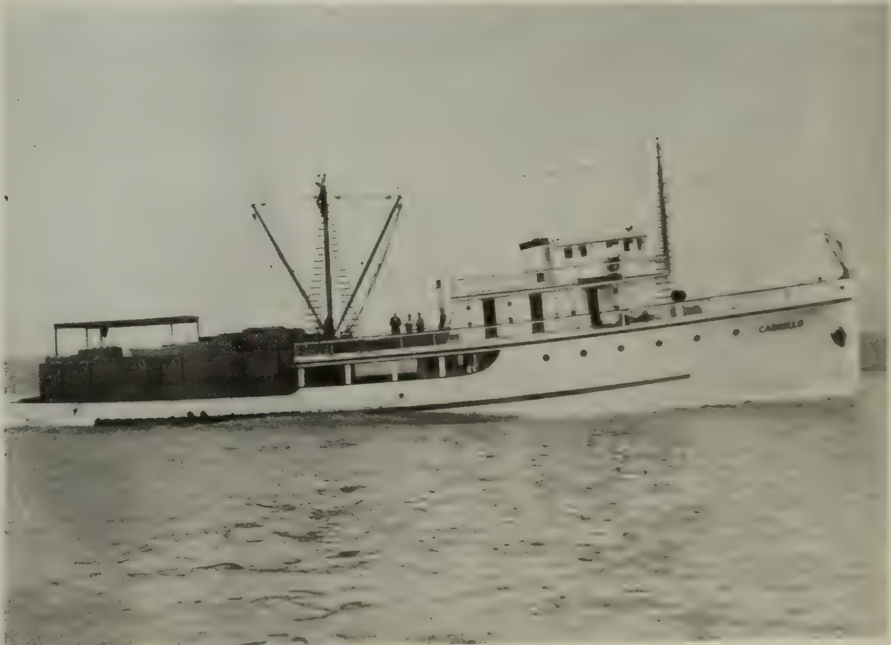
The tuna clipper is a purely California development, and its design and construction followed the evolution of a peculiar type of fishing for the various species of California tuna, "the chicken of the sea." This method requires large quantities of live bait to lure the tuna school to the surface.

Now the yellow fin tuna migrates northward in the summer, southward in the fall and winter. So far the California fishermen have found him in large schools from approximately Cape San Lucas, California, to the Gulf of Panama, and westward 1,000 miles or more. At the beginning of this fishery, the yellow tails were catchable in large quantities right in San Diego Harbor and adjacent waters.

The method of fishing is to locate a school, dump overboard right over this school a quantity of live sardines, then when the school of tuna rises to the surface and begins its mad scramble for sardines, the men start fishing. The men are stationed on railed platforms on the boat's side with their feet awash. They use short heavy poles with strong lines, wire leaders, and a large hook concealed in a lure of white feathers. By perfect coordination of eye, mind, and muscle, the skillful fisherman is able to make the hook fast on the upward leap of the tuna and use the energy of that leap to help land the fish on deck. A backward flip of the line disengages the hook before the tuna has hit the deck, and the hook with its lure is after another fish.

The functions then of a tuna clipper are: To take live bait in good condition to the school of tuna; to form a good platform at sea from which to fish; and to bring the catch back in good condition to market or cannery.

These functions demand a number of features peculiar to tuna clippers. First of these is the bait tank and its auxiliaries. Second, the folding railed iron platforms around the stern on which the men stand while fishing. Third, the refrigerated holds for preserving the catch in good condition on the trip home.



Tuna Clipper Cabrillo built by Campbell Machinery Co., San Diego, 135 ft. by 29 ft. by 11 ft. 10 in. 550 horsepower Union diesel engine. Delivered in 1935.

As the demand for canned tuna increased, the number and size of tuna clippers mounted, and the tuna began to beware the coastal waters of California.

Longer trips accentuated the problems of the tuna clipper. It will be evident that a comparatively small boat is needed as a fishing platform; but if we are to go several thousand miles to get the fish, we must have large capacity of bait tanks and holds in order to insure the safe delivery of a catch large enough to warrant the long trip. This means, of course, larger hulls, more powerful engines to maintain the speed, greater capacity auxiliaries, and heavier construction.

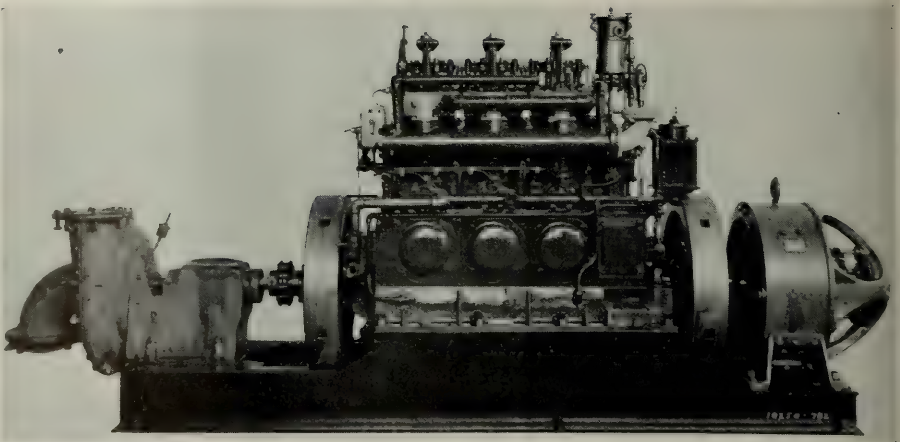
The first "tuna clippers," built in 1924, had lengths about 65 feet, beams about 15 feet, and drafts about 6 feet. They are powered with diesel engines of from 75 to 90 shaft horsepower.

By 1928 these craft had arrived at lengths of 120 feet, beams of 25 feet, and drafts of 11 feet, and were carrying main diesel engines of 400 shaft horsepower.

By 1932 the length had reached 135 feet, the beam 29 feet, and the draft 16 feet. The main engine capacity was 550 shaft horsepower. The capacity in electric auxiliary power was two 75-horsepower diesel generating sets, or double the main engine power of the original tuna clippers designed and built less than 10 years previously. The cruising radius of these ships had increased to 10,000 nautical miles.

The figures above for 1932 still stand as an upper limit in this type of craft, with the exception that the most recent examples are increasing their auxiliary power. Present practice demands duplicate installation for the sea water circulating pumps for the live bait tanks, the diesel engine generating sets, and the refrigeration machinery for keeping the fish hold at the right temperature.

Primarily the tuna clipper is a carrier of perishable cargo. Live bait outward bound—dead tuna in. Continuous operation of bait tank pumps and refrigerating machinery is even more important than dependability of main engines. An hour's shutdown of either of these important auxiliaries may spoil bait or fish and destroy all profits of the trip.



A favorite auxiliary unit for large fishing boats is a diesel engine driving a centrifugal pump at one end and an electric generator at the other. The pump is connected through a clutch and a universal joint. The illustration shows an Atlas unit of this type.

The average voyage of a tuna clipper cruising to Central American waters is 35 to 50 days, during which time she may cover 6,500 miles. Six to eight times yearly she will make such cruises, and will make an annual average of 40,000 miles. Thus over wide measures of space and long periods of time, the ship, her power plant and her crew, form an isolated unit that must be completely self-contained and able to maintain itself against the forces of nature, which often threaten its destruction.

The rapidity of the development of the "tuna clipper" is, we think, unequaled by that of any other special type of commercial vessel. In such rapid development it is inevitable that errors have been made, and several avoidable marine casualies have occurred to the new larger ships in this class. These, so far as we can determine, have been due in each case to the greed, or the carelessness, or the bravado of fisherman owners, and not to any faults inherent in the design. For instance, a fisherman loads his bait tanks to capacity with his fish holds empty, runs in at full speed, makes a wide sweeping turn into a ground swell, and capsizes. Another neglects his soundings and runs on the rocks. Another insists, against the protests of the builder, on increasing the capacity of his bait tank, and so puts his boat into an unstable condition in a sea way.

For their own protection, the fishermen should have inclining tests made of their boats in the light condition and as ready for sea.

● The Future of Fishboats

On the Atlantic Coast, practically every trawler or other type of power driven fishing craft of sizes comparative to our purse seiners or tuna clippers is built of steel. On the Pacific Coast, practically every such boat is built of Oregon pine. One or two tuna clippers have been built of steel.

The continuous increase of power in propulsion and auxiliary machinery makes for very heavy construction in wood. The demand for greater capacity in fish holds, combined with this demand for greater power, makes the attainment of adequate strength in wood construction very difficult. Equivalent carrying capacity can be obtained in a steel hull of smaller overall dimensions and requiring less power for the same speed. Under present conditions steel construction is more costly, particularly on the Pacific Coast.

The enterprising boat builders of Puget Sound are now trying to introduce their type of purse seiner to the Atlantic Coast fishermen. Some of the fishermen of the Pacific Coast are now looking into the merits of steel construction for the larger boats.

If the demands for carrying capacity and power continue to increase, it will soon be necessary to go to steel construction in order to get a hull that will stand up under the work required.

Naval architects will find that these various demands and conditions present some very interesting problems in design and construction.

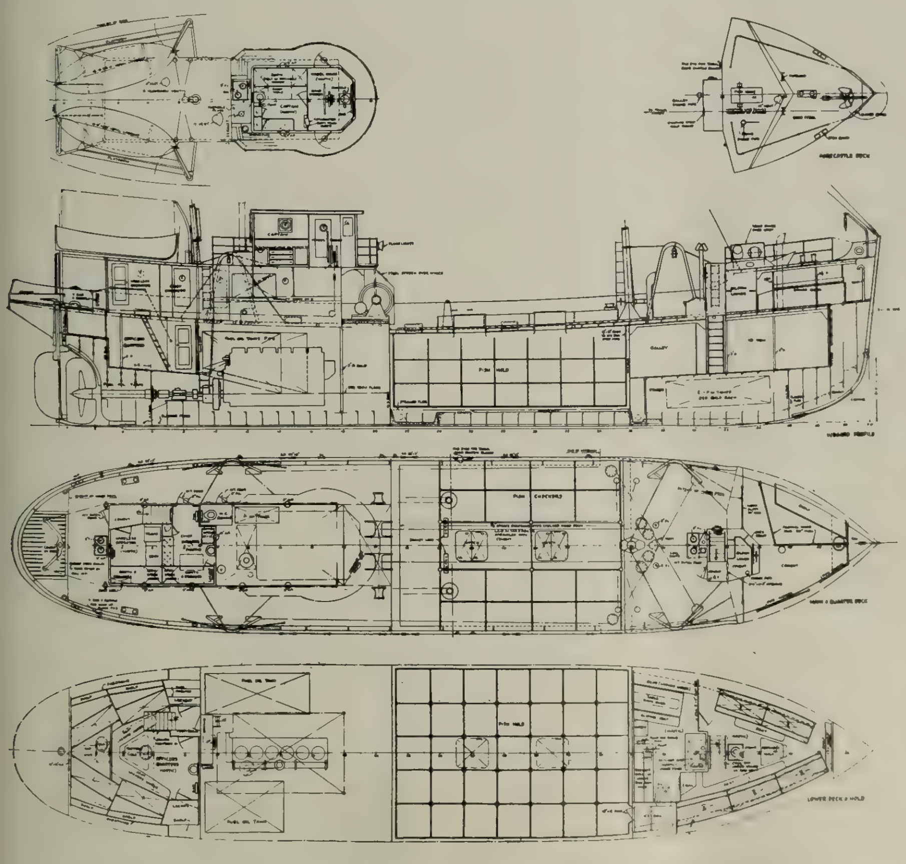
Trawlers Neptune and Triton

Two Steel Diesel Powered Trawlers of a Practical Design, by the Bethlehem Shipbuilding Corporation

Two new steel, diesel-powered trawlers, Neptune and Triton, were completed about the first of September at the Fore River Plant of the Bethlehem Shipbuilding Corporation in Quincy, Massachusetts, by whom they were both designed and built.

These are the tenth and eleventh of the same design to be constructed at Fore River. Previous boats from the same plans are the Quincy, Dorchester, Winthrop, Dartmouth, Amherst, Cornell, Thomas Whalen, Atlantic, and Plymouth, built in groups of three during 1929, 1930, and 1934, and all of which have made excellent records under the vigorous conditions confronting a New England trawler.

In this connection, it is worthy of note that the earliest steam trawler built in this country was constructed at Fore River Plant in 1905. This was the Spray, a steel vessel 136 feet, 4 inches, overall, powered by a Scotch boiler, coal fired, having a compound engine of 450 indicated horsepower. This ship was reconditioned in 1929, the steam engine replaced by a diesel, and, under the name of Patrick J. O'Hara, she is still doing business with the fishing fleet. The Spray, and others of approximately the same type that followed it from 1910 to 1913, were hardly more than modifications of the Grimsby type of trawler. From 1913 to 1927, there was no new trawler work at Fore River; then a new design was prepared for a type of trawler suited particularly to American needs, and planned in accordance with the ideas of the prospective owners. Diesel engine drive was selected from the start, due to its economy of both space and fuel, and a beamy, sturdily built hull planned, thus allowing greater hold capacity than formerly found on trawlers of considerably greater length. Three boats were built from this design in 1928, and may be considered the first departure from earlier types to meet the special requirements of the American fishing industry.



Inboard profile, deck, and hold plans, of the trawlers Neptune and Triton.

A year later, the designing staff of the Fore River Plant, at the suggestion of the owners of one of these three ships, prepared still another design, making use of their experience with the vessels just built to improve upon the latter where possible. In the space of a few years, eleven boats have been constructed from this later design at the Fore River Plant, all practically alike, differing only in minor details of arrangement and make of engine as different owners preferred.

The remarkable success of this design is evidenced by the large number built from the same plans, as well as by repeat orders after five years from the company for which this design was first made, six of these boats now being owned by this company. During the first five years of operation, the three early vessels of this design each averaged 32 round trips and more than 300 days at sea each year, and have brought back as much as 227,000 pounds of fish on a single voyage.

The design presents a vessel of substantial, seaworthy character, capable of remaining at sea under all conditions of weather, as these vessels must do in the course of their regular work. High bulwarks and generous sheer at both ends protect the ship, and, in addition, a full-height forecastle is provided. The quarter deck is raised above the main deck to keep the wash of water from fish and trawl gear from entering the engine room or quarters aft.

Captains of these ships have in every instance reported them to be splendid sea boats, keeping dry and handling well in even the heaviest seas.

The dimensions of all eleven of these vessels are the same. They are:

Length over all	110′ 3″
Length between perpendiculars	102′ 0″
Breadth, molded	22′ 0″
Depth, molded, amidships (To main deck at side)	11′ 7¾″
Mean draft	about 9′ 6″

The power plants of the Neptune and Triton are Nelseco diesel engines, model 6MIR-18, having 6 cylinders of 12½-inch bore and 18-inch stroke, developing 350 brake horsepower at 280 revolutions per minute, and giving a speed of about 10¼ knots. A Kinney clutch is fitted in the shaft, enabling the main engine to be used to drive the trawl winch, mounted nearly above it, which it does through another clutch in the winch drive shaft. Thus the main engine can be used to drive either the propeller or the trawl winch separately, or both together. This arrangement has already been fitted to earlier boats of this class, and found to be very satisfactory. A 10-horsepower single cylinder auxiliary diesel is fitted, driving a 7½-kilowatt generator for lighting, and also an 18½ cubic foot air compressor.

The arrangement provides comfortable quarters for 10 men below deck forward, with the galley separated from these quarters by a light screen bulkhead. Spacious quarters are fitted aft with berths for four officers, and separate rooms in the houses aft for captain and chief engineer. A radio room is also provided, containing the usual wireless transmitting and receiving equipment, and a berth for the operator. A fathometer is installed in the wheelhouse.

The entire construction of the hull and deckhouses is of steel, sturdily built for strength and long life. The forecastle and quarter decks are also of steel, with 3-inch planking on the latter and in the walking space around the after deck-house top. The main deck is of 3-inch Oregon pine laid over steel beams and tie plates, with additional plating in way of the trawl winch and other foundations. Wood is also used for the floor and sheathing in the fishhold, for bins, light divisional bulkheads, and the like.

These ships carry about 97,000 pounds of cement and iron ballast in the fore peak, fish hold, and engine room.

It should be remembered that these little vessels are called on to perform the most strenuous type of work, facing North Atlantic storms as a matter of course and setting and hauling their nets repeatedly in all but the very worst weather conditions. Their work continues all winter, and these vessels often return to port after a voyage laden with ice several inches thick, even on the wheelhouse and rigging. They are also subject to occasional grounding and collision, due to the prevalence of heavy fog in certain seasons over the New England coast and fishing grounds, and these conditions all put together certainly require fishing vessels that can "take it" and come back for more. Most of these vessels do their fishing on banks within about 200 miles of Boston, from which port they operate, but they are easily capable of continuing to the Western Banks, nearly 700 miles out. The fact that almost a dozen of these boats have already been built is definite proof of highly satisfactory design based on intelligent cooperation with the operators, and is a tribute to the skill and workmanship of the builders.

Two Way Radio Telephone for Work Boats

Interesting Tests in Preparation for the Establishment of Regular Commercial Service in the Harbor of New York

Preparatory to establishing regular two-way radio telephone service for commercial craft in New York harbor and nearby waters, The New York Telephone Company has been conducting an operating trial of equipment on seven boats engaged in freight transportation in the harbor. The tests are being made under experimental licenses issued by the Federal Government. Five of the boats are tugs owned and operated by the Pennsylvania Railroad. One of the other two is operated by the Oil Transfer Corporation, and the other by the Socony Vacuum Company.

When the service is opened to the public, after the trials conducted jointly by the telephone company and the transportation enterprises, it is expected to be widely used by various classes of harbor vessels. It might also be used by certain vessels operating in Long Island Sound and on the Hudson River.

The period of trial operation of the harbor radio telephone system is now drawing to a close, and has resulted in many improvements and advances in the art, which will make it possible to offer a high speed efficient service for the towing companies in New York harbor, so that two-way conversations can be carried on between harbor vessels and their dispatchers quickly and easily at any time during the day or night. Connections, when desired, can also be made to any land telephone. The new Western Electric radiophone equipment, said to be the most up-to-date and efficient yet developed, has been tested thoroughly and adjusted to meet the needs of customers for this service. The complete system is now working smoothly in connection with the normal operation of the towing companies.

Radio shore equipment installed by the telephone company includes a 400-watt short wave transmitting station atop the building at 25 Hyatt Street, St. George, Staten Island. A receiving station is located nearby on the island with facilities for inter-connecting the radio voice ways with the telephone company's regular land wires.

During the trial, the seven harbor

boats are communicating to designated points ashore under the direction of the telephone company. These tests supplement earlier ones made by the telephone company with its own cable-laying boat, and have provided further necessary operating experience.

Ship-shore radiophone equipment and service have been developed steadily during the past five years, meeting a growing demand for two-way voice communication with ships. A score of transatlantic liners have adopted the service since the first installation was made aboard the steamship Leviathan in December, 1929.

Plans for radio telephone service for the nation's greatest seaport and water transportation center — New York City—have been under way for several years. Upon the authority of the Federal Radio Commission, the New York Telephone Company completed the transmitting station. Development and improvements in the equipment, however, continued. Special effort was made to produce ship equipment that could be operated effectively and more economically than was possible with existing sets. The result was a low-powered, five-watt set which has been installed on the seven boats.

An improved method of calling the boats by means of selective signaling apparatus also is being utilized. Under the old system of loud-speaker monitoring, the ship crew had to listen constantly for the ship's particular call. But with selective signaling, a regular telephone bell rings on the ship being called, obviating any confusion. The manipulation of the ship telephone is nearly the same as that of the ordinary telephone, thereby making unnecessary the employment of skilled operators on the boats.

The trial, which has been carried on over a period of about two months, has resulted in changes and adjustments that have developed a smooth working and speedy system of communication. Further tests are in progress in connection with the handling of large numbers of messages,

which might arise in the future under emergency conditions, such as in foggy weather, when many of the boats would have urgent need of communication. This portion of the trial has thus far shown very remarkable results, and in the last test of this sort, the messages handled were about twice the record number handled in any previous test. Further tests along these lines are continuing, and it is expected that even a greater number of messages per hour will be handled.

Trade Literature

Type S Diesel. — Ingersoll-Rand Company recently announced its Type S diesel engine. This engine is an improved design thoroughly modern in all respects. It is of the vertical, four-cycle, single-acting, solid-injection type, designed to run at medium speeds and built for heavy-duty, continuous service.

The fundamental design is similar to that of the successful Ingersoll-Rand locomotive engine, of which there are more than 140 in operation. Some of these have been in service for over 12 years.

Type S engines are made with 3, 4, 5, 6, and 8 cylinders, for ratings from 150 to 460 horsepower.

A new 24-page bulletin describing these engines has just been issued. It may be obtained from Pacific Marine Review.

Pacific Marine Review

Storm, Swell and Surf

The Most Modern Ideas in Atlantic Coast Trawlers

The "Forty Fathom Fisheries" (Bay State Fishing Company), of Boston, are building three fine diesel trawlers at the Bath Iron Works plant, Bath, Maine, on a contract let January 8, 1936. The Storm, first of the three, completed successful trials out of Boston harbor on September 9, and the Swell and the Surf will be completed during October.

The Bay State Fishing Company fleet, prior to the building of these three vessels, comprised 14 steam and 2 diesel trawlers. The three trawlers are steel, single screw motorships with several very interesting and novel features in the design and equipment. They are of interest to all fishboat owners and builders because they represent the experience of one of the best Atlantic Coast owners translated into practical form by one of the best builders.

Their principal characteristics are:

Length overall	144 feet, 8½ inches
Length, waterline	131 feet
Beam	25 feet
Depth	13 feet 6 inches
Hold capacity (fish)	400 tons
Engine capacity	600 brake horsepower

In recognition of the hard service of fishing boats on the North Atlantic, the hull proper is of unusually heavy construction, some plates being as much as 50 per cent heavier than the classification requirements. The outer hull is all riveted. All internal steel work, deck houses, and fittings are welded.

The prime factors governing the design and equipment of these vessels are: Ability to ride safely and with comparative comfort in bad weather, and so permit longer fishing periods; power and shape to permit speedy runs to market; refrigerated hold designed to eliminate second and lower grade fish condition; correct trim when fully loaded with fish; and comfort of crew.

The stem has a pronounced forward rake, and the underwater lines immediately aft of the stem are unusually fine, giving a very easy entrance. The stern is of the cruiser type, finely modeled, with a long easy run of the underwater lines to the stern post. These lines enable the trawler to maintain her speed even against head seas, and also are well adapted for easy riding of rough water when trawling or hove to picking up nets and gear.

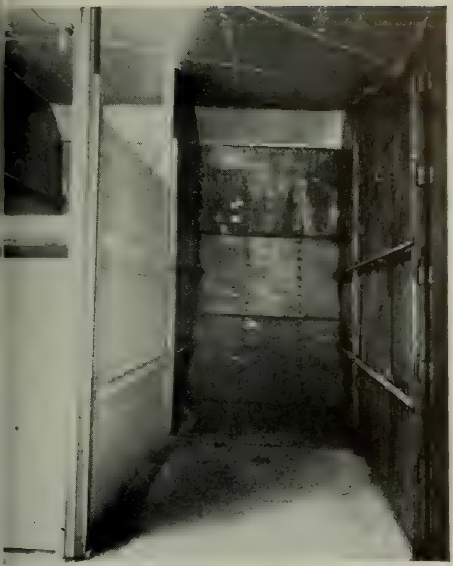
The main power unit is a sturdy, dependable McIntosh and Seymour four cycle, solid injection diesel. With six cylinders, each 17½ inches bore by 25 inches stroke, this engine is rated 750 brake horsepower at 225 revolutions a minute, or 600 brake horsepower at 180 revolutions a minute. The unit is fully reversible and is equipped with everything necessary: Circulating water pumps; lubricating oil pumps, strainers, and coolers; fuel oil pumps and strainers; and over speed control. A Kingsbury thrust bearing is fitted. A 30-kilowatt General Electric generator driven from the flywheel supplies sufficient electric energy to take care of all auxiliary requirements while the engine is running.

To take care of the power load of the trawl winch, the fish handling winch, and the other auxiliaries, a 4-stroke cycle, mechanical injection, non-reversible McIntosh and Seymour diesel engine is provided. This unit has three cylinders 9½-inch bore by 10½-inch stroke, and is rated 130 brake horsepower at 600 revolutions per minute. Direct connected to a General Electric generator, this engine provides 100 kilowatts of electrical energy. This energy is utilized chiefly in handling the trawl winch, which is a special design developed by the General Electric Company and requires a 100-horsepower drip proof frame General Electric D. C. motor for its operation.

The winch has two drums, each capable of winding over 600 fathoms of ⅞-inch wire cable, and each controlled by manual and electrically operated brakes. The drum shaft is driven through a worm and worm gear mounted in the center between the drums. Drums may be controlled from either side of the winch.

Ample space for safe working conditions is provided in the engine room. An interesting item is the installation of a modern unit type heater, which warms the engine

Motor trawler Storm, claimed to be the most modern vessel of her class.



A fish compartment in the hold.

room in winter, cools it in summer, and keeps it properly ventilated in all seasons.

The quarters for officers, crew, and a few guests, are arranged and equipped for comfort and for easy maintenance of sanitary condition. In the crew's forecastle, there are comfortable berths and individual lockers for 12 men. Entrance is through a sheltered vestibule, with a washroom and drying room alongside, so that no wet clothing need be taken into the living quarters. The forecastle is equipped with a shower and two toilets.

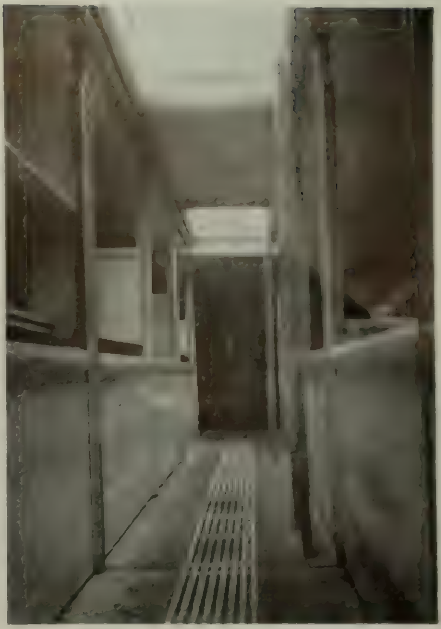
The officers live in the main deck house aft, and are mostly quartered in single berth rooms with ample washrooms, toilets, and showers, off adjacent passageways. Trim, splash boards, and drainboards, of Monel metal make the galley a pleasant place for the ship's chef.

● Refrigerated Holds

Most important as a new feature in these trawlers is the novel design of the fish hold. The controlling idea of the design is to guarantee "pound sold for pound caught" by the elimination of soft fish and fish contaminated with bilge water or soaked with the water from melting ice. To accomplish this ideal, it was necessary to produce a well insulated, perfectly water tight, perfectly drained compartment. Space and weight considerations led to the idea of metal lining, and overall economy considerations led to the choice of Lukens Nickel Clad steel.

The holds are completely lined with Nickel Clad steel welded at all joints and spot welded to the framing of the hull, making a good water tight job with a smooth inner surface all nickel, giving no chance for corrosion or rust, and very easy to clean.

Between this nickel clad steel lining and the outer shell plating there is a 3-inch layer of cork insulation. Under the bottom lining the cork thickness is two feet, and between the lining and the deck it is 10 inches. The cork is attached to the steel on both sides by a special bonding cement. Air ducts on the inner side of the cork insulation are supplied with dry (dehumidified) refrigerated air, which is capable of maintaining a temperature of 32 to 36 degrees Fahrenheit throughout the hold. By temperature adjustment of this air, the rate of melting of ice in the hold can be controlled so as to preserve just enough humidity for the prevention of dehydration in the fish. It is figured that this method will make it possible for the Storm and her sisters to bring home the fish in good condition with only 20 tons of ice, compared with 60 tons in the old style holds. This saving, added to the lighter weight of the steel lining, enables these new trawlers to carry home approximately 400,000 pounds of fish, as compared with 300,000 pounds with the former construction.



The central aisle of the fish hold.

As will be noted in the illustrations, the hold has a concrete floor sloped to the center and a drain trough on that floor along the center line of the hull. This trough is covered with a grating and is sloped to a sump tank in the engine room, from which the drainage is pumped overboard.

The cost of these trawlers approximated $200,000 each.

Galley of trawler Storm, featuring Monel metal sink trim.

Investigating Marine Casualties

Bureau of Marine Inspection and Navigation Issues the "Marine Investigation Board Rules of 1936"

● Rule I. Marine Investigation Boards

Section 1. "B Marine Investigation Board."—The Board appointed for the investigation of a Marine Casualty or accident or other matter, not involving loss of life, classified by the Secretary of Commerce as serious; also any alleged act of incompetency or misconduct in connection therewith committed by a licensed officer or a holder of a certificate of service or efficiency, shall be known as the "B Marine Investigation Board."

Section 2. "C Marine Investigation Board."—The Board appointed for the investigation of a Marine casualty or accident or other matter, not involving loss of life, classified by the Secretary of Commerce as less serious; also any alleged act of incompetency or misconduct whether or not committed in connection with such marine casualty or accident, by a licensed officer or holder of a certificate of service or efficiency, shall be known as the "C Marine Investigation Board."

Section 3. The B Marine Investigation Board may be addressed "The B Marine Investigation Board, Department of Commerce, Washington, D. C." The C Marine Investigation Board may be addressed "The C Marine Investigation Board, Department of Commerce, Washington, D. C."

Section 4. The permanent dockets and records of the Boards shall be kept in the Bureau of Marine Inspection and Navigation, Department of Commerce, Washington, D. C. Their public records shall be open for inspection at reasonable times.

● RULE II.—Definitions

In these rules, unless the context or subject matter otherwise requires—

Section 1. Marine casualties and accidents not involving loss of life shall include—

(a) Any marine casualty or accident involving any vessel, near the coast or within the navigable waters of the United States, its territories or possessions.

(b) Any marine casualty or accident involving any American vessel, or vessel owned by any person domiciled in the United States, wherever such casualty or accident may occur.

Section 2. When used in these rules—

(a) The term "party in interest" shall mean any person whom the Board shall find to have a direct interest in the investigation conducted by it and shall include an owner, a charterer, or the agent of such owner or charterer, of the vessel or vessels involved in the marine casualty or accident, and all licensed or certificated personnel whose conduct, whether or not involved in a marine casualty or accident, is under investigation by that Board.

(b) The term "the Act" shall mean the Act of May 27, 1936, Public, No. 622, amending Section 4450 R. S.

● RULE III. Notice of Marine Casualty or Accident

Section 1. Whenever there is a marine casualty or accident not involving loss of life, immediate notice thereof by telegram or radiogram or equally prompt means of communication shall be given by the master, owner, charterer, or agent of the vessel or vessels involved to the nearest local office of the Bureau of Marine Inspection and Navigation of the Department of Commerce, or to the Bureau of Marine Inspection and Navigation, Department of Commerce, Washington, D. C. Such notice shall furnish the names of the vessel or vessels involved, the owner or agent, the nature and cause of the casualty or accident, the locality, the nature of injuries to persons, and damage done to property. Such notices shall be in addition to any other notice required to be given by existing law and regulation. Any officer or employee of the United States or any other person having material knowledge or information concerning a marine casualty or accident shall immediately bring such information to the attention of the Bureau of Marine Inspection and Navigation.

● RULE IV. Voyage Records

Section 1. The owner, charterer, agent, master, or other licensed officer of any vessel involved in a marine casualty or accident shall retain the voyage records of the vessel, including both rough and smooth deck and engine room logs, bell books, navigation charts, navigators' work books, compass deviation cards, stowage plans, records of draft, aids to mariners, radiograms sent and received, and the radio log, and crews' and passengers' lists, which upon request shall be produced for the inspection of the Board or its agents whenever required.

● RULE V. Questionnaire

Section 1. In order to facilitate the work of the Board any party in interest or other person shall, within such time as designated after any questionnaire respecting matters relating to a casualty or accident shall have been served upon them, file with the Board or its designated agent the exact information requested by such questionnaire.

● RULE VI.—Preliminary Investigation

Section 1. When a marine casualty or accident not involving loss of life has occurred an investigation shall be promptly instituted by the appropriate Board.

Section 2. Upon the happening of a marine casualty or accident not involving loss of life a preliminary investigation may be conducted by employees of the Bureau of Marine Inspection and Navigation regularly assigned by the Director for that purpose. When necessary beyond territorial limits of the United States, such preliminary investigation may be conducted by an American Consul. Reports of all such preliminary investigations shall be promptly forwarded to the appropriate Board. If during the course of any preliminary investigation there shall be reason to believe that serious misconduct on the part of any person has taken place the appropriate Board shall immediately be notified.

● RULE VII. Hearings

Section 1. The Board shall determine, so far as possible, the cause of any casualty or accident and the persons responsible therefor.

Section 2. Whenever a charge has been placed against a licensed officer or holder of a certificate of service or efficiency he shall be entitled to a copy of the charge prepared by the appropriate board and shall be given reasonable notice of the time and place of hearing and an opportunity of making a defense.

Section 3. The Chairman of the Board shall administer all necessary oaths to any witnesses appearing before it.

Section 4. Any party in interest to a proceeding before the board shall have the right to appear at such proceeding in person, or by counsel, to call, examine, and cross-examine witnesses, and to introduce into the record documents or other evidence. Appearance of any counsel representing a party to a proceeding before the board should be entered and filed prior to the commencement of the proceeding.

Section 5. The whole record of the testimony received by the Board conducting an investigation and the findings and recommendations of such Board shall be forwarded to the Director of the Bureau of Marine Inspection and Navigation.

Section 6. If the Director shall find that such licensed officer or holder of certificate of service or efficiency is incompetent or has been guilty of misbehavior, negligence, or unskillfulness, or has endangered life, or has wilfully violated any of the provisions of this title or any of the regulations issued thereunder, or any other law or regulation providing for safety at sea, he shall, in a written order reciting said findings, suspend or revoke the license or certificate of service or efficiency of the holder of such certificate.

Section 7. When any party to a proceeding before the Board desires an extension of time or that a hearing be continued to another date he shall be allowed to apply for such extension of time or continuance by addressing his reason therefor in writing to the Board. Such application should be filed at least three days prior to the date set for hearing. The Board will then rule on the application and grant such extension of time or continuance for good cause shown. In the event any party in interest in a proceeding fails to file his application for a continuance within the time hereinbefore set forth, the Board may in its discretion still entertain such an application at any time before actual hearing, provided it is made to appear that the failure to file his application timely within these rules was due excusably to causes beyond the control of such party.

● RULE VIII. Attendance of Witnesses—Production of Records

Section 1. Subpoena requiring the attendance of witnesses may be issued by any member of the Board, and may be served by a United States Marshal or his deputy, by a local inspector or by any person specially appointed by the Board for that purpose and not otherwise. When service is made by any person other than a United States Marshal or his deputy, such person shall describe by affidavit the manner in which service is made, and return to the Board such affidavit on or with the original subpoena in accordance with the form thereon. In case of failure to make service the reason for failure shall be stated on the original subpoena. In making service the original subpoena shall be exhibited to the person served, shall be read to him if he is unable to read, and a copy thereof shall be left with him.

Section 2. Subpoena for the production of books, papers, documents, and any other evidence (Subpoena Duces Tecum) unless directed by the Board of its own motion, will, issue only upon application in writing. No subpoena duces tecum shall be issued in any cause without an order of the Board. Applications to compel witnesses who are not parties to the proceedings, or agents of such parties, to produce documentary evidence must be verified and must specify, as nearly as may be the books, papers, documents, and any other evidence desired and the facts to be proved by them. Applications to compel a party to the proceedings to produce books, papers, documents, and any other evidence, should set forth, the books, papers, documents, and any other evidence sought with the showing that it will be of service in the determination of the proceeding.

Section 3. Any attempt to coerce any witness, or to induce them to testify falsely in connection with a shipping casualty, or to induce them to leave the jurisdiction of the United States, shall be punishable by a fine of $5,000 or imprisonment for one year, or both such fine and imprisonment as provided by the Act. Any person making such attempts shall be prosecuted by the Federal district attorney of the district having jurisdiction.

● RULE IX. Exhibits

Section 1. When relevant and material matter offered in evidence by any party is embraced in a book, paper, or document containing other matter, not material or relevant, the party must plainly designate the matter so offered. If the other matter is so voluminous that it would unnecessarily encumber the record, such book, paper, or document will not be received in evidence but may be marked for identification and, if properly authenticated the relevant and material matter may be read into the record, or, if the Board so directs, a true copy of such matter in proper form, shall be received as an exhibit.

Section 2. Models, diagram and other matter forming part of the evidence should be placed in custody of the Board or its agents where the hearing is to take place at least one day before any case is heard or submitted.

● RULE X.

All matters and records, other than records of public proceedings, shall be treated as confidential during the pendency of any investigation, unless the Director or Secretary shall otherwise order.

● RULE XI. Appeal

Section 1. Any person whose license or certificate of service or efficiency is revoked may within thirty days appeal from the order of the said Director to the Secretary of Commerce. On such appeal the appellant shall be allowed to be represented by counsel. The Secretary of Commerce may alter or modify any finding of the Board which conducted the investigation or of the Director of the Bureau of Marine Inspection and Navigation, but the decision of the Secretary of Commerce shall be based solely on the testimony received by the said board and shall recite the findings of fact on which it is based.

Section 2. Every appeal from the decision of the Director of the Bureau of Marine Inspection and Navigation shall be typewritten and shall set forth as briefly as possible the nature of the charge, shall declare the Board which heard the case, shall state the decision of the Director and shall contain the grounds for such appeal separately stated and shall be verified by the appellant or his counsel. The appeal shall take effect as of the date of filing with the Secretary of Commerce.

● RULE XII. Witness Fees

Section 1. Witnesses summoned before the Board under Subsection E of Section 4 of the Act shall be paid on application for their actual travel and attendance, a fee not exceeding the rate allowed for fees to witnesses for travel and attendance in the district courts of the United States, and witnesses whose depositions are taken and the persons taking the same shall severally be entitled to the same fees as are paid for like services in the District Courts of the United States. Forms of vouchers may be made out by any employee at a local office of the Bureau. Fees and travel allowance shall be paid after vouchers properly certified by a member of the Board conducting the hearing have been presented to the Assistant Disbursing Officer of the Treasury Department, if such officer is situated in the locality where the hearing is held; otherwise, by presenting said voucher to the Local Board of Local Inspectors of the Bureau of Marine Inspection and Navigation authorized by the Disbursing Officer of the Treasury Department to act as Agent Cashier.

● RULE XIII. Computation of Time

Section 1. The time, within which, within any act, provided by these rules, or an order of the Board is to be done, shall be computed by excluding the first day and including the last unless the last day be Sunday or a legal holiday, in which case the time shall extend to and include the next succeeding day that is not a Sunday or legal holiday; provided, however, that where the time fixed by these rules or an order of the Board is five days or less all intervening Sundays and legal holidays other than Saturday half holiday, shall also be excluded.

● RULE XIV. Construction of Rules

Section 1. These rules and regulations shall be liberally construed to effectuate the purposes and provisions of the Act.

Section 2. These rules shall have the force and effect of the Act of May 27, 1936, amending Section 4450 R. S.

Section 3. Any of these rules or regulations may be amended or rescinded at any time after publication in the Federal Register.

Serious Marine Casualties and Accidents and Other Matters Coming Within the Scope of the Investigation Powers of the "B Marine Investigation Board" as Provided by the Act of May 27, 1936, amending Section 4450 R. S.

I. Serious marine casualties and accidents not involving loss of life shall include the following:

(a) Collisions between vessels resulting in a total property damage to hull or machinery amounting to $20,000 or more or total loss of any vessel of 500 gross tons or over.

(b) Collisions between vessels either of which carries 200 or more passengers, or between two or more vessels, the gross tonnage of either vessel amounting to 8,000 tons.

(c) Collisions between a vessel and a lock, dock, pier, harbor bridge, jetty, breakwater, structure, beacon, cable, sunken object, etc., or any aid to navigation resulting in property damage to either vessel or object collided with or both amounting to $20,000 or more.

(d) Fire on board a cargo vessel or tanker resulting in property damage amounting to $10,000 or more to the vessel or $15,000 or more to the cargo.

(e) Any fire not of a confined nature aboard a vessel carrying 100 or more passengers or inflammable cargo, such as gasoline, explosives, etc.

(f) Any main boiler explosion aboard a vessel where any person has sustained serious bodily injury.

(g) Any explosion aboard a vessel of 300 gross tons or over due to any cause resulting in property damage amounting to $5,000 or more or the disablement of the vessel.

(h) The wrecking, sinking, or foundering of a vessel of 1,000 gross tons or over or of a vessel carrying 100 or more passengers.

(i) Abandonment of a vessel of 500 gross tons or over at sea or on inland waters.

(j) Grounding or stranding of a vessel resulting in property damage amounting to $20,000 or more to bottom plates, keel, keel plates, floors, transverse frames, longitudinal frames, intercostals, or any other principal part of the hull or propulsion machinery.

(k) Disablement of a vessel of 10,000 gross tons or over at sea for which a proper cause is not apparent and the safety of the vessel, passengers, or crew has been placed in jeopardy regardless of whether the vessel has been towed into port or been rendered any other assistance.

II. Serious matters which shall be investigated by the "B Marine Investigation Board" shall include the following:

(a) When three or more persons have sustained serious bodily injuries as a result of any marine casualty or accident involving a vessel regardless of the nature of the casualty, the amount of property damage, size or type of vessel, etc.

(b) Complaints against licensed officers and holders of certificates of service or efficiency alleging incompetence, negligence, misconduct, intemperance, or any violation of any of the provisions of this title or any regulation issued thereunder when committed in connection with any serious marine casualty or accident as herein classified.

(c) Any vessel of 500 gross tons or over remaining unaccounted for after an unreasonable length of time has elapsed since the vessel was last heard from.

Less Serious Casualties and Accidents and Other Matters Coming Within the Scope of the Investigation Powers of the "C Marine Investigation Board"

1. All marine casualties and accidents and other matters within the provisions of this Act, not involving loss of life, and not classified herein as serious shall be deemed and considered as less serious and investigated as such by representatives of the Bureau of Marine Inspection and Navigation designated by the Director thereof.

(Page 369 Please)

. . . Observed at
Los Angeles Harbor

Waterfront Employers Association of Southern California, Incorporated, was organized at Los Angeles harbor, effective September 1. This organization is based on the old Marine Service Bureau, active at this port since 1921. Edwin Nichols, manager of the Bureau, is secretary-treasurer of the Association, and E. A. Mills, for many years chairman of the old body, is now president of the new. Vice presidents are Fred A. Hooper, district manager for the American-Hawaiian Steamship Company, and J. B. Banning, district superintendent for the Matson Navigation Company.

Directors, which include the above-named officers, are F. J. McGowan, general manager of the Outer Harbor Dock & Wharf Company; J. L. Hook, Jr., district manager, McCormick Steamship Company; John E. Marshall, president of John E. Marshall, Inc.; Guy E. Buck, district manager, Grace Lines; Lloyd R. Richards, assistant traffic manager in charge of the steamship department here for Sudden & Christenson; Capt. H. H. Birkholm, vice-president and Southern California manager, General Steamship Corporation; Harry R. Dorr, resident manager, Norton, Lilly & Company; and Edgar M. Wilson, general agent, Dollar Steamship Lines, Inc., Ltd., and president of the Los Angeles Steamship Association.

The district and ports covered by the new corporation include Hueneme-Santa Barbara on the north and San Diego on the south.

Foreign Trade: Exports and imports during the month of August totaled $13,592,000, according to preliminary figures of the Marine Exchange. The month was exceptional in that imports exceeded exports to a greater degree than has ever before occurred in the history of Los Angeles-Long Beach harbor. Exports were only $5,050,000, caused by the fact that it is the off-season for cotton shipments; while oil exports likewise were low. Imports, on the other hand, aggregated more than $8,500,000. The largest item was vegetable oils and fats, which, together with oil seeds, exceeded the two million dollar mark. There was a rush of those commodities to get in before the new high tariff took effect on August 21. Crude rubber aggregated one and a half million dollars. Raw silk was another one and a half million dollar item.

Receipts of lumber for the month exceeded 72 million feet, compared with a little over 60 million feet in July.

The total oil shipments for the month aggregated 5,460,000 barrels, which was 800,836 barrels more than July, or a gain of 17.1 per cent, but which showed a decrease from August of last year of 559,281 barrels, or 9.2 per cent.

Super Fast Freight: The world's fastest airplane is a special Caudron-Renault speedster, built for Lieutenant Michael Detroyal by the French Government at a reported cost of $1,000,000. Consigned from Havre, France, for Los Angeles to take part in the international air races there, it was placed aboard the Normandie in Havre, met by a special Santa Fe car at the New York docks, and rushed across the continent by fast freight. Total time, Havre to Los Angeles, 13 days.

Palatial Yacht Sold: The Casiana (formerly Cassandra), palatial 287-foot steam yacht of the late Edward L. Doheny, Sr., for many years laid up in Los Angeles harbor, has been sold by the executors of his estate to the Philippine Commonwealth Government for $50,000. Delivery is to be at Manila in October. It is reported that she will be used as a Philippine presidential yacht.

The steel craft was built by the Scotts, at Greenock, in 1908. She has twin screws driven by two 3-cylinder triple expansion steam engines, and is fitted for burning fuel oil. She is said to have cost Doheny $800,000.

With this ship under him, President Manuel Quezon will have a much more pretentious yacht than the president of any other commonwealth, but she is apt to prove quite an expensive toy.

New Mexican Consul: Elias Colunga has been appointed Mexican consul at Los Angeles, taking the place of former consul Ricardo G. Hill, recalled to Mexico City to fill another diplomatic post.

Record Passenger List: As the Pennsylvania, of the Panama Pacific Line, cleared from Los Angeles harbor on September 6 for New York, via Acapulco, Panama, and Havana, she carried the largest list of passengers for any September sailing by the intercoastal route since 1929 —a total of 485.

Contrary to the rule for this time of year, a large part of those on board was composed of Californians, off for recreation trips.

● Straws in the Trade Winds

An Interesting Shipment. The Chilean chinchilla is a very valuable fur. The animals are rare, and are found only in lofty plateaus of the Andes. Pan-American Airways is a very efficient organization. Recently this organization booked for California, by plane from Santiago, Chile, 36 live chinchillas, valued at $200.000. The shipment was accompanied by two expert keepers. The chinchillas arrived in first-class condition.

Revolutionary Benefits. The unsettled conditions in Spain have practically stopped her exports of quicksilver, and thereby benefited the American quicksilver industry, the bulk of which is dependent on Pacific Coast mines for its raw product.

Seattle Shipping Briefs

● New Pacific Coast Company Terminal

Terminal and warehouse development of the Pacific Coast Company on the Seattle waterfront, a project costing $300,000, is nearing completion. The new terminals group Piers A, B, C, and D, and a remodeled brick building, which offers office facilities and warehouse space.

The McCormick Steamship Company has taken over Pier B for general offices and the berthing of its vessels operating in the coastal, intercoastal, and South American trade. The Luckenbach Steamship Company has leased Pier D and, beginning November 1, will berth the vessels of its North Atlantic and Gulf Services at this terminal. General offices of the Pacific Coast Company and subsidiary corporations have been moved from Smith Tower to newly prepared space in the brick building on the waterfront at the foot of Main Street. This move, which concentrates the company's executive forces on Alaska Way South, is designed to give greater convenience to customers as well as to facilitate company business.

Ships of the Luckenbach fleets have been berthing at Pier 1, which was leased from the Northern Pacific Railway Company on August 28, 1922. Pier D has a clear-span interior of 135 feet, a dock area of 105,000 square feet, and a warehouse area of 73,000 square feet. There is a depressed track on the south side, a flush track on the north side, and an elevator on the west end of the terminal.

The entire terminal group, including the office and warehouse building, will be painted tan and aluminum.

S.S. Stuart Dollar in Lake Washington ship canal on her way to Todd Drydocks, Inc., Seattle, for big reconditioning job.

An artist's conception of the new Pacific Coast Company's $300,000 Seattle terminal.

● Dollar Freighter Reconditioned

Todd Seattle Dry Docks, Inc., ship repair plant on Harbor Island, is busy reconditioning the 10,200-ton freighter Stuart Dollar, purchased recently by the American-Hawaiian Steamship Company from the Dollar Steamship Lines.

The Stuart Dollar, after being idle for more than two years, was towed from her moorings in Lake Union through the Lake Washington Ship Canal to the Todd Plant. The vessel was built by the Kiangnan Dock & Engineering Works in Shanghai in 1920, and was christened Mandarin. She arrived in Seattle on June 12, 1934, from Shanghai, and four days later went into Lake Union for her long lay-up.

● Fresh Fruit Movement

Seattle is busy with the annual movement of fresh fruit from eastern Washington for the 1936-37 season. Shipping schedules show that a total of sixty-nine refrigerator vessels will berth in this port for the period from September 1 until November 30. September's total was twenty-seven carriers calling for the products of the orchards of eastern Washington.

Thirty-five ports of discharge in the British Isles, France, Germany, Holland, Belgium, Norway, Sweden, Italy, Spain, and the Holy Land, have been scheduled by seventeen services operating ships flying the flags of eight nations. They are the Royal Mail, Hamburg-American, Holland-America, North German Lloyd, Furness, Interocean, Fruit Express, Blue Star, Johnson, East Asiatic, French, Lauritzen, Fred Olsen, Donaldson, Italian, Knutsen, and Reardon Smith lines. The home flags of this refrigerated ship fleet include those of Great Britain, Germany, Holland, Norway, Sweden, Denmark, France and Italy.

● Sale of Cargo Vessels

Petition of the Tacoma Oriental Steamship Company, a Dollar Line affiliate, for permission of the Federal Court to sell the freighters Bellingham and Everett to the Waterman Steamship Corporation, of Mobile, Alabama, was heard by Judge John C. Bowen at Tacoma on Friday, September 18. The deal involves $200,000. The Tacoma Oriental Company was reorganized under Section 77-B of the National Bankruptcy Act, and is under the jurisdiction of the court. The Bellingham and Everett are units of a fleet of five former Shipping Board freighters, and operated in the transpacific trade.

● Large Repair Job

Repairs to the freighter Texada, costing $90,000, are under way at the plant of the Winslow Marine Railway & Shipbuilding Company. The vessel is owned by the Kingsley Navigation Company and is operated in coastal service. She received extensive hull damage when she stranded in heavy fog on August 14 on Eagle Reef, McNeil Island, Puget Sound. The contract called for completion of the work in forty days. Three shipyards bid on the work.

● Port Personals

Capt. F. E. Lovejoy, president of the Propeller Club of the United States, Port of Seattle, has appointed a committee to make a study of lights and pier numbers on the Seattle waterfront in an effort to correct the confusion that now exists. Two years ago, the fact that the present lights and pier numbers were confusing to navigators was brought to the attention of shipping men and renumbering of the piers suggested.

S.S. Mount McKinley, unit of the fleet of the Alaska Steamship Company, which sailed from Seattle on September 6 for Nome and other Bering Sea ports, replacing the famous old gold ship Victoria. The Mount McKinley, formerly the Santa Ana, was purchased on the East Coast by the Alaska Steamship Company from W. R. Grace & Co. She will bring a big shipment of gold bullion from the Seward Peninsula of Alaska to Seattle.

The committee consists of **William Claussen,** of the Pacific Coast Company, chairman; **Comdr. O. W. Swainson,** United States Coast and Geodetic Survey; **Capt. Guy Kongsle,** Shipping Board Sea Service Bureau; and **Carl Nordstrom,** Seattle naval architect.

Capt. William Langley, president of the Santa Ana Steamship Company, and veteran mariner of the North Pacific and Alaska, has been appointed a member of the resolutions committee of the Propeller Club of the United States by **Arthur M. Tode,** of New York City, national president of the organization. Captain Langley will be the only member of the committee from the Pacific Coast. As a delegate from the Seattle Propeller Club, he will leave Seattle on September 22 for Boston, where he will attend the national convention of the organization. Captain Langley represented Seattle at the national convention of the Propeller Club held in New York last winter. He will be accompanied on the trip by Mrs. Langley, and after the convention they will visit New York, Washington, D.C., Jacksonville, Pensacola, New Orleans, Los Angeles, and San Francisco.

New Slow Speed Heavy Duty Diesel

The Lorimer Diesel Engine Company, of Oakland, California, is specializing in a practical heavy duty diesel engine in the low power range, adapted for small power plants, pumping plants, and propulsion units for small boats.

This engine is a vertical four-stroke-cycle, valve in the head motor built with a single size of cylinder in one or two cylinder units. The cylinder has 6-inch bore and 8-inch stroke, and develops 15 brake horsepower at 550 revolutions a minute.

Bases and crank cases are fabricated by welding from steel plates. The cylinder is of close grained nickel cast iron, and has large spaces and passages for the cooling water. The bore is accurately machined and ground. Pistons are 12 inches long and are fitted with six rings, giving ample bearing and assuring long life in service.

Special steel, completely machined connecting rods, fitted with phosphor bronze wrist pin bushings, connect the piston with the crank shaft, which is of special steel 4 inches in diameter, counter-balanced, and completely machined. Forced lubrication is carried to all bearings in the engine and to the reverse gears.

The Bosch mechanical injection fuel system is used. A high tension magneto, spark plugs, and a carburetor are incorporated in the design, and very easy starting is accomplished by barring the engine over as a gasoline engine. After sufficient speed is acquired, the engine is converted into a full diesel motor by throwing one little lever over to the diesel position.

Fifteen of these engines have been sold to date, and are in satisfactory operation in industrial, agricultural, or marine service.

Port of Portland Notes

Business of the Port

Portland's foreign trade assumed a brighter hue during September, when wheat began moving in large amounts for the first time in two years and when fresh apples and pears hit their stride in foreign trade.

The first full wheat cargo to go abroad since the fall of 1934 was loaded on the Danish motorship Stjerneborg for delivery at Cork and Dublin, Ireland. The vessel also took a deckload of lumber. Her master is Captain R. M. Rosenhoj, who has become exceedingly well-known in Grays Harbor as the result of two long delays there during the waterfront strike of 1934 and the logger's strike of 1935.

The largest fresh pear shipment ever to go from a Pacific Northwest port was taken from Portland early in September by the Norwegian fruit carrier Washington Express, for French and British ports. It totaled 55 carloads, or more than 41,000 boxes.

Another important ship of the month was the African Reefer, midget Lauritzen liner, which loaded the season's first apples and pears for Palestine, Alexandria, and Marseilles. This line has scheduled sailings about every three weeks during the fruit season from Portland and Seattle, and has also announced two sailings of non-refrigerated ships, the Jutta, in October, and the Paula, in November, to take dried and canned fruits to Mediterranean ports.

Captain Mele J. Gordenev, new skipper of S.S. Maunalei.

Victor Harari, young English fruit broker, who now headquarters in Alexandria, is spending the autumn months in Oregon, Washington, and California, booking apples and pears for delivery at the ports of call of the Lauritzen ships.

U. S. Engineers at Work

Proposed sale of the old United States Engineers survey boat Geo. H. Mendell, after 47 years of service in the Columbia River district, has been announced by the engineer corps. The Mendell was officially retired when the new $230,000 Robert Gray was commissioned on September 8. Bids for her will be opened on October 13.

A sturdy little steamer 102 feet long, displacing 200 tons, the Mendell is expected to end her career either as a tow boat or as a pilchard fisheries purse seiner.

The engineer corps transferred the seagoing dredge Clatsop and the tug H. M. Adams from the 1st Portland district to the San Francisco district early in September to aid in building the 1938 exposition grounds. Another Columbian River dredge, the Multnomah, had already been at work in the Bay area for five months. Both are scheduled to return to Portland next summer.

Deepening of the Coos Bay ship channel to 24 feet is expected to start this fall. Tacoma Dredging Company submitted the low bid $179,214. The channel has had a project depth of 22 feet for many years.

Lieutenant-Colonel Milo P. Fox, district engineer for the 1st Portland district, held a series of flood control hearings at Tillamook, Taft, Newport, Florence, Reedsport, Marshfield, Coquille, Medford, and Roseburg during September, in accordance with provisions of the national flood control act of last June.

Maritime Clubs

Portland's maritime organizations are getting under way for the fall and winter season. The newly-organized Propeller Club has been receiving applications for charter membership and expects to start the season with at least 50 on the rolls.

The chapter was founded during the summer visit of Arthur M. Tode, ex-national president, and K. C. Conyers was elected first president. As soon as the charter membership roll is completed, the officers plan to call a meeting for the election of the board of directors, which would chart the course for the future.

Portland Shipping Club's first fall meeting was held on September 16. H. K. Cherry, new president, presided, and Frederick G. Leasure, director of vocational education in the Portland public schools, spoke on big game hunting in central Africa.

While the Propeller Club's membership is limited to American maritime men, the shipping club includes those representing foreign as well as American services.

Captain M. A. Cloninger
Lightning bags geese for his Sunday dinner.

● A Lucky Pilot

Captain M. A. Cloninger, Columbia River pilot, is declared by his fellow pilots to be the luckiest pilot in the world.

"He's always at the right place at the right time," they say of him.

His latest exploit was his sitting in a rowboat off the north end of Swan Island airport on September 1 when lightning struck 20 geese flying high overhead and they tumbled into the water nearby.

Captain Cloninger and a youth who manned the boat immediately picked 12 of the cacklers out of the water, and they and their friends enjoyed roast goose dinners in due course.

The lucky pilot said he happened to be in the boat because the Japanese steamer Tohsei Maru was not ready to shift berths when he arrived. The lad, he said, was having difficulty operating a casting rod and he was giving him instruction between rain squalls when the lightning brought down the geese.

The matter has been referred to Mister Ripley.

● A Dream Fulfilled

For 11 years, Mele J. Gordenev had dreamed of the day that he might take command of one of the Matson Line's larger freighters. His dream was fulfilled on September 5, when he arrived in Portland to take command of the Maunalei, which makes the triangular run from San Francisco to Portland, Seattle, and Honolulu once each month.

Captain Gordenev is a native of Russia, and when the World War opened 23 years ago, he held the rank of commander in the Russian Imperial Navy. He left Russia during the Kerensky regime and, after a series of exciting affairs in this country found himself penniless in San Francisco.

After several years on the beach, working as a janitor, carpenter, and electrician, and gradually learning the American language, Gordenev turned back to the sea by signing on a Matson steamer as a seaman. Within five years, he earned master's papers in the American merchant marine, and for six years he was master of the lumber steamer Mapele, ex Mala.

The promotion to the Maunalei came last month when Captain C. L. Brocas was transferred to the Manukai, assigned to the San Francisco-Honolulu direct run. Captain Brocas was on the Maunalei for 2½ years.

● Windjammer Grain Race

The famous Australia-U. K. grain race may sound like a big thrill to some people, but to Robert Reusswig, 17-year-old Portland youth, it turned out to be just a lot of hard work.

Returning to his home from Cork, Ireland, where he left the big Finnish bark Moshulu upon completion of her maiden voyage in the race, Robert confessed that he wouldn't mind making the trip again, because he believes more valuable experience can be gained there than anywhere else at sea.

Having decided, upon graduation from high school a year ago last June, that he wanted to become a licensed officer at sea, and to start from the bottom, Robert signed on the Moshulu at Victoria, B.C., with a crew of 13 Finns, three Canadians, and two other Americans, under Captain Gunnar Boman, who was sent from Europe by Captain Gustaf Erikson to take command of the German-built bark.

The voyage in ballast from Victoria to Australia required 75 days, while the long run around Cape Horn took 113 days and included a detour of several weeks to near the coast of Greenland before the vessel found a favorable wind to take her to Ireland.

The Moshulu was a member of Charles Nelson fleet of San Francisco for a number of years, and when she ran out of the Columbia River with lumber, Portland was her home port.

● Port Personals

Two brothers, **Dave and Chester Dewey,** and their wives, of Taft, Oregon coast town, plan to make a five-year world cruise on their 47-foot Norwegian coast guard type yacht, Oregon Webfoot, sailing from Astoria to San Francisco, San Pedro, Panama, Galapagos Islands, South Seas, China, Malay, India, Africa, Suez, and Atlantic. They inaugurated the voyage by taking a party from Taft, 100 miles south of Astoria, to the Columbia River city for its annual regatta on September 1.

Two Dutch ship captains, **J. P. Wepster,** of the Holland-America liner Damsterdyk, and **J. Hamersma,** of the Silver-Java-Pacific liner Kota Agoeng, were reunited in Portland on September 4 for the first time in 25 years. They were classmates in navigation school, graduating in 1901. While Captain Wepster has been in the merchant marine many years, Captain Hamersma is relatively new to the merchant trades, having spent his career in the Dutch navy. He is a retired lieutenant-commander.

After a serious illness which confined him to Emanuel Hospital, Portland, for several weeks, **Captain R. C. (Jimmy) Brennan,** one of Portland's most colorful waterfront figures, was reported recovering last month. Captain Brennan was the war-time commander of the veteran coastwise steamer Yale, taking her from San Francisco to Southampton in 1918 to operate as a troopship across the English Channel. During the last few months of hostilities, he transported 268,000 Allied soldiers and wounded across the Channel without a loss of life or damage to his vessel. For several years, he was superintendent of Oceanic terminals, Portland, and lately has been associated with Jones Stevedores, Inc., handling cargo work on the Admiral Line steamers at Portland. He was a former Admiral Line master and port captain.

● States Line Limits Passengers

Unable to see the value to be derived from remodeling its three passenger steamers, General Pershing, General Sherman, and General Lee, to conform with certain requirements of the shipping act of 1936, States Steamship Company, of Portland, has announced that passenger carrying of the vessels will be limited to 16 persons per ship, effective October 1, 1936.

The announcement was made by Kenneth D. Dawson, president of the company. In an explanatory letter to Williams, Dimond & Company, San Francisco agents of the line, Dawson declared that final decision of the future disposition of the line's passenger service would not be made until after the Federal Maritime Commission provided to administer the shipping act had announced its

Safety at Sea

By J. Montgomerie, D. Sc.

(Continued from Page 346)

There was considerable opposition to any increased loading for tankers, and there were not wanting those who prophesied evil in the result. It is pleasant to be able to state that these forebodings have not been realized in fact. During the past few years we have made in Lloyd's Register a close examination of every report received from the staff on sea damage to tankers, and the result shows conclusively that the experience of these years compares favorably with any antecedent period. Even deck damage, which at the time it was thought reasonable to suppose would be more frequent, has not been sensibly increased.

It is very unlikely that the basis for freeboard assignment will be altered in the near future. If it is, it is worth while considering whether the length of the ship should be a basis—length which affects neither the reserve buoyancy nor the height of platform. It is also worth considering whether it would not be right, for the smaller ships, to increase the freeboard as at present assigned.

C. Subdivision. Owing to certain influences which need not be detailed here, safety at sea, until fire began to be mentioned, was held apparently to be solely concerned with internal subdivision and the contributions made to the proceedings of various technical societies on this subject are many, all following upon the loss of the Titanic in 1912, and the deliberations in London that followed it. The recommendations then agreed upon by the London Convention were embodied in an instrument which was expected to be adopted internationally. This, however, was not done, although in England an Act was passed to give effect to the Convention, but the statutory operation of this Act was postponed from time to time by Orders in Council. In spite of this, however, the Board of Trade embodied the majority of the recommendations in their instructions to their surveyors, so that in effect these provisions were made applicable to British ships.

It soon appeared that the findings of this body of eminent experts had been perhaps unduly affected by the recent disaster to the Titanic which had provoked public interest in this matter. It was apparent that the new regulations contained defects and that ships of the mixed passenger and cargo type were very heavily penalized. It became evident that it was inexpedient to include all types of passenger vessels in one comprehensive scheme. Here is an analysis of the economic effect on the ships of one fleet complying with the regulations:

Number of ships in the fleet carrying passenger certificates	70
Summer deadweight of these vessels	698,377 tons
Approximate reduction in deadweight assuming ships not permitted to load beyond a Convention draft	175,000 tons
Reduction in deadweight in single vessels in the fleet actually built to the Convention rules	2,500 tons
Extra cost of Convention requirements irrespective of draft restriction	3 to 4 per cent

There were also criticisms of the methods of calculation laid down—their difficulty and laborious nature. It was not surprising, therefore, that the problem was attacked anew with the result that, after 15 years of discussion, the regulations took their present form as embodied in the International Convention for the Safety of Life at Sea, 1929. The final effect was to maintain a high standard of subdivision for purely passenger vessels and to modify that for the mixed type and for vessels of special type or service.

What about purely cargo vessels which do not come within the scope of the Convention? One could not expect the cargo ship to attain a higher standard of safety than that represented by a one-compartment ship and, as a fact, ships built to the rules of the various classification societies do attain this standard, if the bulkheads are reasonably spaced.

In raised quarter deck vessels it is impossible to obtain anything approaching the one-compartment standard with the classification number of bulkheads.

In shelter deck vessels with tonnage openings, less than 470 feet in length, it is almost impossible to obtain the one-compartment standard, unless the bulkheads are all carried up to the shelter deck. In vessels over 470 feet in length, however, it would probably not be so difficult to obtain a reasonable disposition of bulkheads which would approach the one-compartment standard.

In shelter deck vessels without a tonnage opening and in awning deck vessels it would be necessary to carry all the bulkheads up to the shelter deck, if the one-compartment standard is desired.

It will be seen from the facts adduced that it is a matter of great difficulty to obtain a one-compartment standard in vessels even as large as about 405 feet, and that this difficulty is enhanced with any departure from the usual three-island type of vessel.

There has fortunately been no spectacular occasion which would have afforded concrete evidence of that additional amount of safety secured by the final regulations, but I think it must be admitted that these represent a reasonable compromise between the claims of safety on the one hand and those of economic operation on the other.

● Fire

(a) Passenger Vessels. Outbreaks of fire on board ship are in very many instances effectively dealt with by the crew. Thus in a period of two years, from March, 1930, to February, 1932, out of 23 outbreaks of fire that were reported on British passenger vessels 19 resulted in little or no structural damage, two ships suffered serious damage, and two became constructive total losses. It is necessary to remember these facts so as to have an accurate idea of the magnitude of the problem of fire prevention.

This is one of the chief concerns of the Convention for the Safety of Life at Sea. That instrument provides for the fitting of divisional fire bulkheads, for the provision of fire alarm and fire detecting systems, for powerful service pumps, and fire patrol. These are definitely minimum requirements and in practice many more safeguards than these are provided in the highest class of vessel. A closer fireproof subdivision is obtained; sometimes sprinklers are installed, and use is made of impregnated wood for cabin accommodation and of non-inflammable material.

The regulations recently embodied by the French Government in a Decree may be taken as the high water mark of fire prevention. The fire subdivision rests on the basis of the Convention requirement that these be spaced 131 feet apart. This space is to be further subdivided into areas of 450 square meters and 150 square meters respectively, and for each there are different types of bulkheads required. The material for the interior fittings is divided into three categories with tests imposed for each standard. There are also tests required for paints, linoleums, rubber coverings, etc. The use of inflammable materials for furniture and fittings in passenger and crew spaces is to be limited. Light fabric furnishings and carpets are to be fireproofed, and reproofed after being washed. The arrangements for fire patrol, for detection, and for extinguishing are elaborate. The Decree applies to all vessels the keels of which are laid after April 1, 1935.

(b) Cargo Vessels. The causes of fire in cargo ships are:— bad stowage; the loading of such cargoes as coal, jute, cotton, or wool without providing sufficient ventilation; the proximity of cargo to the boilers; and imperfect isolation of fuel oil or spirit.

Some time ago the committee of Lloyd's Register desired that an investigation be made of the causes of fire. An analysis was made of fires reported in the 12 months March, 1930, to February, 1931, from which two interesting facts emerge: First, that in the great majority of cases the cause of the fire was unknown; and, secondly, that the percentage of fires in motorships is more than double that in steamers. Of the ascertainable causes a relatively large proportion is found in conditions relating to coal-carrying ships and in bunkers.

In 1929, the Department of Scientific and Industrial Research in England reported the result of an investigation made by them into the causes of fires in steamship bunkers and in coal cargoes. An analysis of that report shows that in the three years 1925 to 1928, 310 such fires occurred in 246 ships. Of these, 280 were in the bunkers and 30 in coal cargoes. Here is a statement of the causes:

No. of cases	Percentage of total	Cause
199	65	Direct Heating
36	11	Incomplete removal of coal from bunkers
18	6	Air leakage into bunkers
11	4	Faulty ventilation

An examination of all the information available led to the formulation of certain conclusions which were presented to the committee of Lloyd's Register. Among these the most important are:

1. That all coal gives off some inflammable gas when freshly worked, and also when freshly broken, and that this gas becomes explosive when mixed with certain proportions of air. It is the evolution of this gas which requires the ventilation of the bunkers before entering them with naked lights.

2. That heating of coal, and the consequent risk of spontaneous combustion, does not proceed from the presence of gas, but is caused by the absorption of oxygen from the air.

3. That this absorption, and the accompanying development of heat, is greater at high than at low temperatures, so that, when once commenced, it proceeds at an increasing rate if the supply of air is maintained.

4. To minimize the absorption of oxygen by the coal in reserve bunkers, or in any bunker in which men are not actually working, the lower doors should be kept absolutely closed, so as to prevent any current of air whatever passing through the bunker and into the mass of coals.

5. If any coal is left in a bunker when a fresh charge has to be taken in, it should be trimmed into a position to insure its being used on the next voyage. It cannot be too strongly impressed upon those responsible, that danger of overheating and spontaneous combustion increases with the length of time the coal remains in the ship.

6. There is no risk entailed by the coal being wet when put on board. In fact, in cases where coal is known to be of a fiery nature, it would be of an advantage for the small coal to be damped when charging the bunkers.

All experiences with fires at sea in combustible cargoes, such as cotton, support strongly what would seem to be a commonsense point of view; namely, that when cargoes of this nature are carried some effective method should be adopted of preventing a long shelter deck space from being converted into a gigantic chimney.

A general survey of the facts bearing on safety at sea suggests that the principles enunciated by those who laid the foundation of the practical art of ship construction, are sound. All that has happened since their day has proved that, and their successors have been required to apply these principles to ever-changing circumstances and conditions.

The modern ship is a happy combination of simplicity of structure and ample structural strength. The problem of stability is better understood, and its theory is reinforced by a huge volume of experience. The proportion of losses to the total number of ships adventuring on the waters is steadily decreasing, and the intelligent cooperation of officers and crews in avoiding loss or damage is now greater than at any time in the past.

Marine Insurance Review

Stability of Purse Seiners

By David W. Dickie

The record of the purse seiners in recent months shows that one boat disappeared with 18 men and that at least four upset at sea.

If a boat is lost by stranding in the fog, there is usually an excuse, however inadequate, but when a boat upsets, someone ashore is usually directly and inexcusably responsible. The situation is so serious that the purse seiners, which have not had the benefit of years of operation, should have an inclining experiment performed with all of the tanks and the fish hold half full of fuel or water, and a certificate of seaworthiness with respect to stability issued as a prerequisite to the issuance of marine insurance.

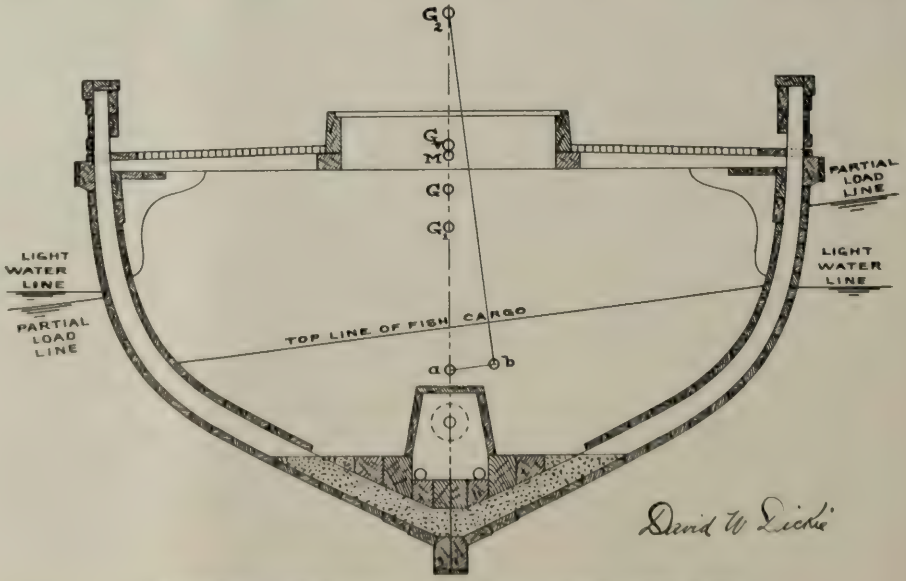
It is definitely known that the design from which the accompanying section was taken is dangerously unstable when partially loaded to the level shown.

The center of gravity of the boat with its fuel, water, and stores aboard is at the point (G), and the line of flotation is marked "light water line." During loading, the level of the fish in the hold rises until it comes to the height shown on the drawing. As the loading proceeds, two changes in the position of the center of gravity of the boat take place. The center of gravity of the weight of the boat, combined with the weight of the fish, assumes a new position, marked (G_1). The virtual center of gravity, which is a third point (G^v), assumes a position that is due to a combination of the effects of the weight of the boat, the weight of the fish, and the movement of the fish as the boat leans over due to the brailing operation. When the boat inclines, the center of volume of the fish moves from the point (a) to the point (b), and a vertical line drawn from (b) gives the virtual position of the weight of the fish (G_2), so far as the stability of the boat is concerned. This moves the position of the virtual center of gravity of the boat and the fish from (G_1) to (G^v), and (G^v) is above (M). (M) is the location of the metacenter, the position of which corresponds to the point about which a pendulum swings. When any one of the three positions of the center of gravity passes above the metacenter (M), a dangerous condition exists, which probably would cause the boat to upset.

The positions of (M), (G), (G_1), and (G^v) were plotted for different designs, and the section shows the dangerous condition of loading — that is, when (G^v) passes above (M). In absolutely smooth water, and with skillful loading, it might be possible to load the boat without upsetting it. The slight margin of safety that would permit this is the effect produced by the flare of the bow and the stern as the boat inclines.

An investigation of the factors governing stability disclosed that increasing the beam of the boat from 25 per cent to 30 per cent of the length made practically no difference in the stability while loading. The stability of the boat increases as the cube of the beam, but decreases as the cube of the width of the cargo hold. The beam of the boat can be increased in the center, but it must be tapered off to nothing at the ends, while the width of the cargo hold is increased for practically its entire length. Shortening the cargo hold 8 per cent only reduced the distance from (G_1) to (G^v) about 2 inches, an amount insufficient to be of material benefit. In other words, the whole model has to be changed.

Increasing the amount of the concrete in the bottom of the boat low-



Thwartship section through fish hold of typical purse seiner.

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ers the position of the center of gravity in its three phases, but in addition to raising the fish cargo, detracts from the carrying capacity of the boat. This adds stiffness to the boat in the light condition, reduces the stability while loading, and raises the fish cargo as a whole, all of which are detrimental. Excess stiffness during the early stages of loading causes the boat to roll and grind the fish to a mush.

It is of importance that the fish be handled as little as possible and not be allowed to drop long distances. This led to the practice of building up the shifting boards in a fore and aft position in the hold as the fish were brailed in. When the boat rolled, the fish passed over the top of the shifting boards to the low side and did not return, due to the prevention of the return roll. Finally the shifting boards in the hold were abandoned as being more nuisance than benefit.

Much can be said for the model of the Grimsby trawlers and how it was developed, after many years of experience to meet the foregoing conditions; but these boats are built of steel, and the Grimsby model must be modified before it can be built of wood and used for a purse seiner.

By changing the form, it is possible to have the boat float on an even keel when light and be 18 inches down by the stern with the hold full of fish and none on deck. No doubt the 18 inches trim by the stern can be reduced, but to do so introduces some undesirable attributes. The previous design had 22 inches trim by the stern with the same loading.

Where an effort is being made to improve speed, carrying capacity, strength, seaworthiness, stability, and comfort in a sea way, some sacrifices must be made on each to obtain the best compromise of them all, but a boat should be absolutely fool proof against upsetting and drowning the crew.

New Lightship on Nantucket Shoals

Lightship Number 112, a new vessel built specially for the Nantucket Shoals Station off the Massachusetts coast, is now on duty, according to an announcement by the Lighthouse Service of the Department of Commerce. This ship, having all of the latest types of signaling equipment, including powerful masthead light, high powered radiobeacon, compressed-air operated fog signal, and submarine signal, is of a new hull design. Longitudinal bulkheads and numerous watertight compartments guard against the dangers of collision, and the vessel has been pronounced the safest lightship in the world.

In the new ship, the fullest use is made of radio in the sending of warning signals and for communication purposes. The ship's radiobeacon will broadcast guiding signals that may be intercepted by other ships two hundred miles or more away. As ships approach closer to the lightship, they will also hear special warning radiobeacon signals, which indicate the proximity of the lightship. Distance finding facilities are also to be available when ships are within range of the fog signals on the lightship, the radiobeacon signals being synchronized with the sound signals for this purpose.

So that the lightship may always be exactly on her charted station, she is equipped with a radio direction finder, with which the officers can take bearings on various shore stations. For communication with passing ships, and for the transmission of information regarding the state of the weather and the sea in the vicinity of the lightship, the new vessel is equipped with the usual radio telegraph transmitter and receiver. Radiotelephone communication between the lightship and other Lighthouse Service ships and shore stations will be maintained.

In outward appearance, Lightship Number 112 will resemble rather closely Lightship Number 117, which was sunk on this station two years ago. The hull of the ship is painted red, with "NANTUCKET" in large white letters on each side. The superstructure is painted white. Number 112 is a steam propelled steel

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vessel built at Wilmington, Delaware, and was just recently completed.

Nantucket Lightship is known to thousands of persons, as it is frequently the first evidence of nearness to America seen by vessels bound for the port of New York from the northern parts of Europe. Nantucket shoals is one of the most exposed lightship positions in the world.

Marine Insurance Notes

Edward T. Cairns, vice president Fireman's Fund Group of fire and casualty companies, is en route East for a month's business trip. Going via the Southern route, Mr. Cairns will visit company departmental offices at Atlanta, New York, Boston, and Chicago. He will also attend the annual convention of the National Association of Insurance Agents at Pittsburgh before returning to the companies' head offices in San Francisco.

B. G. Wills, vice president Fireman's Fund and Occidental Indemnity Companies, attended the annual meeting of the Western Safety

ROY C. WARD GEO. B. DINSMORE WILFRED PAGE
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INSURANCE
BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

Conference, held in Salt Lake City, from September 21 to 24.

Having been requested to speak in response to the address of welcome, Mr. Wills said in part:

"In our deliberations here, we confront the problem of life and death and those major accidents that so often make life a form of living death.

"The misery, poverty, and suffering that are brought into the American home through the medium of accidental death and injury is inexcusable. It is the result of public indifference. There is nothing surprising about this indifference. It is said that everybody knows it—that apparently nobody does anything about it, and that nobody knows just what to do about it, and even if he did, he wouldn't know just how to do what ought to be done. Public opinion in this country is almost disastrously ignorant. It is our job to find ways and means of overcoming this indifference and this ignorance.

"Ours is a noble work—our special contributions to the welfare of many tomorrows are the inculcation of vigilance and carefulness and the demand that the machinery that carries forward the work of civilization shall not, through negligence or ignorance, be forged into a weapon of death or disablement. I cannot believe that the American people will permit indefinitely the practice of 'kill and pay'."

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The Western Safety Conference was organized in San Francisco a year ago, Mr. Wills serving as its first general chairman.

War Risks: The Spanish disturbance raises the war risk question again. Institute of London Underwriters have issued a statement concerning premium scale. Rates are to be fixed at certain intervals. All vessels under Spanish flag, or vessels that, since August 1, have transferred from Spanish to a foreign flag, are to be excluded. Premiums do not cover any land risk, apply only if shipment is made within seven days of date of application for insurance, and are subject to cancellation for 48 hours. The minimum premiums for ports in Spain, the Balearic Islands, and Spanish Morocco, are ¾ per cent.

Another Windjammer Gone: On April 25, last, the Finnish grain ship "Herzogin Cecile," a fine steel four masted bark (shipentine), went on the rocks off the South Devon coast, and after various efforts to raise funds to take her off, she has finally been abandoned as a total loss. One of the larger units of the sailing ship fleet of G. Erikson, of Marieham, this vessel was built in 1902 at the famous Rickmers yards, Bremerhaven. Her tonnage measurements were 3242 gross and 2498 net. Between perpendiculars, her length was 314.1 feet, with a beam of 46 feet and a depth of 23.8 feet. She was a fine sailer, and took part in many a Cape Horn race.

Swedish Marine Casualties, 1935: The Swedish Board of Trade during 1935 received 436 reports concerning casualties at sea in which Swedish ships were involved. These reports classify as follows: 27 total losses of ship; 134 strandings; 115 collisions; 49 sprang leaks or received other damage during voyage; loss of life accompanied 27 cases; and aggregate gross tonnage lost, 13,116. Captain Bergstrom, technical adviser to the Board of Trade, declares that one of the lessons learned from a study of these casualties is the advisability of equipping all vessels with patent sounding apparatus and with radio piloting apparatus.

Queen Mary's Sister: The new Cunard-White Star liner, sister to Queen Mary, which is about to be laid down at Clydebank by John Brown, will furnish the European marine insurance market with its principal topic of thought for some time to come. The Cunard (Insurance) Agreement Act lays down the rates and conditions that are to apply on her building risk insurance, and provides that the Board of Trade shall on these conditions and at these rates accept any amount that cannot be absorbed by the open market. The market will, of course, as a matter of pride, do its prudent utmost to absorb the entire line. Befor her completion, this line will run to £5,000,000.

Marine Casualty Investigations

(Continued from Page 358)

2. In the event the "C Marine Investigation Board" shall undertake to investigate any matter which, during the course of such investigation, the Board in its judgment should determine to be more properly within the jurisdiction of a "B Marine Investigation Board," then the said "C Marine Investigation Board" with the approval of the Director, shall certify such investigation to a "B Marine Investigation Board" for proper action. The Director, within his discretion, may certify any case pending before a "C Marine Investigation Board" to a "B Marine Investigation Board" for proper action.

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On the Ways-

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Edited by F. DRYDEN MOORE

Activity Foretold for Pacific Coast Yards

A glance through Pacific Marine Review of three years ago discloses some interesting and important facts concerning merchant shipbuilding then under way in American yards, especially as to new construction.

At this time, according to our report, there were building three ocean-going vessels of a size worthy of note—one, a passenger and cargo vessel of 1,400 gross tonnage in progress of construction at the Lake Washington Shipyards; the others, two 410-foot freight vessels at the Newport News Shipbuilding and Drydock Company. True, various small craft were building, but these were few in number and were mostly comprised of barges, the remainder being composed of such types as dredges, ferries, small inland waterways vessels, and the like, great neither in size nor in number building. This shipbuilding program, it is apparent, was no very impressive one, either in gross tonnage under construction or in size of vessels, but was rather a sort of occupational idleness on the part of the shipyards.

Compare this report for a moment with the merchant construction activity summarized in that department of the present issue. One fact is particularly outstanding—there are this month building in our shipyards eighteen tankers, while during the period just considered, there was not one. A very large number of barges, allocated to every part of the country, together with ferries, trawlers, pleasure craft, and so forth, furnish a further illustration of the activity apparent in the present shipbuilding program. A yet more hopeful omen is the projected building under consideration, in some instances involving the replacement of or addition to freight and passenger services entailing the construction of a fleet of vessels for one company.

Large construction has so far been confined to yards located on the Atlantic Coast; the East being first to fall under the effects of sub-normal conditions, a revival in trade and industry naturally originates and spreads from that section. However, increased activity is sweeping Westward in constantly growing measure, and will continue to do so.

Here on the Pacific Coast we look forward to the coming and, we believe, imminent time when the tremendous revival in tanker construction will reach our own yards, bringing with it a new and broader outlook for Pacific Ocean shipping. With the passage of the Ship Subsidy Act, involving the six per cent differential for Western yards, we are indeed assured that it will come, for this act has placed our yards in a position to submit bids favorably comparable with those of any yard in the United States. We have the facilities, the knowledge, and the experience; when contracts are awarded, we shall be ready to carry them to completion.

Todd Awarded Reconditioning Contract

Todd Seattle Dry Docks, Inc., has been awarded contract for reconditioning the freighter Stuart Dollar, recent acquisition of the American-Hawaiian Steamship Company. At a cost of $100,000, the work will require about two months for completion, and is one of the largest contracts let to a Seattle yard in recent years.

Fellows and Stewart, Inc., Building Diesel Cruiser

Fellows and Stewart, Inc., Wilmington, California, are building a 45-foot twin screw diesel commercial cruiser, which will be used for taxi service among the channel islands. Delivery is expected about October 15.

Contract Let for Barges to General Engineering

The United States Engineers Office has let contract to the General Engineering and Drydock Company, Oakland, California, for the construction of two 80-foot wooden barges. Further details are not available at present.

Bushey Building Towboats

Contracts for the construction of three towboats have been awarded Ira S. Bushey & Sons, Inc., Brooklyn, New York. Two of the boats will be 76 feet long, of all-welded construction, and will be of 450 horsepower each, power being furnished by diesel engines. The third towboat will be 90 feet in length, of all-welded construction, diesel powered, and will be of 750 horsepower.

The tanker J. A. Cummings is at the same yard for repairs, entailing cutting the ship in half and adding 20 feet in length.

Levingston Shipbuilding Company Constructing Ferry

The Levingston Shipbuilding Company, Orange, Texas, has under construction an all-welded steel, twin screw diesel electric ferryboat for the Algiers Public Service Corp., New Orleans, Louisiana. The ferry will have an overall length of 149 feet, beam over guards 66 feet, beam molded 54 feet, depth molded 11 feet. It will be powered by two 350-horsepower Cooper-Bessemer diesel engines with Westinghouse generators and motors.

In addition, the yard is building an all-welded full model hull diesel tug 55 feet long, 14 feet beam, and 7 feet 6 inches deep, for the Atlantic, Gulf & Pacific Co., of New York City, to be powered with a 120-horsepower Fairbanks-Morse marine diesel engine. An all-welded steel derrick barge, 50 feet by 28 feet by 5 feet 3 inches, is also building, for the Austin Bridge Company, Dallas, Texas.

Maryland Drydock Company Awarded Contracts

Contracts have been awarded Maryland Drydock Company, Baltimore, Maryland, for three steel covered lighters 120 feet by 30 feet by 8 feet, by the Merchants & Miners Transportation Company. The yard is also constructing a steel, double ended, diesel electric ferryboat, for Norfolk, Virginia.

Boarding and Fumigating Boat Will Be Built by Spedden

A 60-foot iron hull, all-welded V-bottom boarding and fumigating vessel for the United States Public Health Service is building at the yards of Spedden Shipbuilding Company, Baltimore, Maryland. The new boat will be equipped with twin screw Superior diesel engines.

Fishing Boat Building at Western Boat Building Company

At the yard of Western Boat Building Company, Tacoma, Washington, a purse seine fishing boat, keel No. 120, is in process of construction. The boat will be 87 feet long by 23 feet beam, and will be powered by a 240-horsepower Atlas Imperial engine. The keel was laid on September 15, but no owner has as yet been named.

Bethlehem Awarded Dredge Contract

Contract for construction of Hull 1463, Goethals, hopper dredge for the U. S. Army, has been awarded to Bethlehem Shipbuilding Corporation, Fore River Plant, Quincy, Massachusetts. The dredge will have a capacity of 5,000 cubic yards and, it is estimated, will be delivered in February, 1938.

Destroyer Lamson to be Delivered Soon

The torpedo boat destroyer Lamson, building at the Bath Iron Works yard, Bath, Maine, for the U. S. Navy, is expected to be delivered on October 27, it is announced. The Lamson was launched on June 17 of the present year.

Navy Department Awards Contracts for Construction Program

The Navy Department recently awarded contracts to four private yards for construction of six destroyers and three submarines as part of the building program for naval vessels. Two of the destroyers were awarded to the Newport News Shipbuilding and Drydock Company at a cost of $4,125,000 each; two to the Federal Shipbuilding and Drydock Company, Kearney, N. J., at $4,267,000 each; and two to the Bath Iron Works Corporation, Bath, Maine, at $4,343,150 each. The Electric Boat Company, Groton, Connecticut, was given the contract for construction of the three submarines, each to cost $2,734,000. In addition, the Navy Department assigned two submarines to the Portsmouth Navy yard, two destroyers to the Boston yard, one destroyer to the Norfolk yard, and one destroyer to the Charleston yard. It is possible that two additional destroyers and a submarine may later be ordered, and if so, their construction will probably be assigned to naval yards.

Calmar Line Planning Six Freight Vessels

Announcement was made by H. W. Warley, vice-president and general manager of the Calmar Steamship Corporation, of New York, that the firm is planning six 18-knot freight vessels to be used in its intercoastal service. Each vessel will cost approximately $3,000,000, and will be about 13,000 tons deadweight and powered with turbines. Designs for the ships are still in the formative state, and it is expected that construction will not start for over a year. The new ships will replace the present twelve freighters operated by the company, but, owing to their greater speed, will maintain the same weekly sailing schedule.

Port of Portland Planning New Ship

A new river steamer for service between Portland, The Dalles, and Astoria, is being planned by the Port of Portland, it is understood. The ship, to be named Columbia Queen, will be designed by Guy Thayer, naval architect of the Port of Portland, and will be 225 feet long, 36 feet beam, and of 1500 tons, with accommodations for forty automobiles and 1,000 passengers.

The two under decks will be covered and the top open. Other features of the ship will be a dance hall, a dining room with a seating capacity of 250 persons, and twenty staterooms. Power will be supplied by a 3,000-horsepower, noncondensing steam engine with 32-inch cylinders and 8-foot stroke, and will be capable of developing a speed of 18 knots.

Moore Dry Dock Company Awarded Repair Contract

The American-Hawaiian Steamship Company has awarded contract to the Moore Dry Dock Company, Oakland, California, for reconditioning the three steamships recently purchased from the Dollar Line. These ships are the Melville Dollar, Diana Dollar, and Margaret Dollar, and work on the first will be completed within 43 days; on the second, in 62 days; and on the third, in 78 days. The amount of the contract was $251,858. After reconditioning, the vessels will be operated in the American-Hawaiian Steamship Company's Williams Line service between the Pacific Coast and the South Atlantic.

New Fireboat for Seattle

An amount of $125,000 has been tentatively approved by the Seattle, Washington, City Council for construction of a fireboat, with which it is proposed to replace the old fireboat Snoqualmie, junked several years ago.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Completion date 9/19/37, **Hull 5356—Maury (DD401);** completion date 12/19/37; two 1500-ton destroyers for U. S. Navy; length, 341' 3⅝"; beam, 35' 6⅛"; depth, 19' 8". Cost $2,675,000.

Hull 5359, Pacific; seagoing hopper dredge for U. S. Engineers; completion date, April 2, 1937.

DRYDOCK AND ROUTINE REPAIRS: **W. M. Irish, H. C. Folger, K. R. Kingsbury, Shell Barge No. 6, W. S. Miller, M. B. Maltha, Santa Paula, Talamanca, Frank H. Buck, H. M. Storey, Beaconlight, Barge Martinez, Tug F. A. Douty, American Fisher, Beaconoil, Matsonia, Monterey, Pres. Van Buren, Antigua, D. G. Scofield, Fr. Str. San Diego, Point Bonita, W. S. Rheem, M. S. Sinaloa, Shell Oil Barge No. 5, Stm. Sch. Redwood, Paul Shoup, Chiriqui, Santa Rosa, Sacramento Valley, M. S. Hawaiian Standard, Maunganui, Heffron, Point Montara, Manukai, Point Sur, Albert Hill, Herbert L. Pratt, Pacific Grove.**

FELLOWS AND STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **4 keels laid** July 6, 1936, Fellows Craft stock cruisers 30' x 8' x 2'6", powered with Kermath Sea Flyer 6-cylinder 85-H.P. engines with 2 to 1 reduction gears.

Hull No. 655, 45 ft. twin screw diesel commercial cruiser for "taxi" service among the channel islands; **estimated delivery, October 15, 1936.**

DRYDOCK AND ROUTINE REPAIRS: Drydocking and general overhaul, repairs and maintenance work, on fifteen vessels ranging from 50 to 110 ft.

GENERAL ENGINEERING AND DRYDOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

NEW CONSTRUCTION: **Two wooden barges,** 80 feet long, for U. S. Engineers.

DRYDOCK, PAINT, MISCELLANEOUS: **Tug Estero, Tug Sea Ranger, Oregon, Gas. S. Delta Standard, Gas. S. Sea Star.**

DRYDOCK AND ROUTINE REPAIRS: **Paul Shoup, Tug Arabs, Oil S. Port Costa, Steel Engineer, Lightship No. 76, Stanwood.**

HARBOR BOAT BUILDING CO.

Berth 264—Fish Harbor
Terminal Island, Calif.

NEW CONSTRUCTION: **Four 80' U. S. Coast Guard patrol boats; 1,600 H.P.** each; Liberty-Vimalert conversions; speed 30 m.p.h.; expected completion, July, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Purse seine fishing boats Orion, Southland, Clermont, Louise Ray, Islander.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Empress of Canada, President Monroe, President Garfield, Ship Star of Lapland, Yacht Zaca.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Olympic, Argyll, Merritt, Chapman & Scott, Hopper Barge No. 7, El Capitan, M.V. Chris Knudsen, California, Golden Sun, Edna Christenson, M. V. Manoeran, M.V. Minato Maru.**

THE MOORE DRYDOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Iowan, T. H. Wheeler, R. J. Hanna, Golden Cloud, West. Pac. Barge No. 2, Pac. Coast Aggregates Barges No. 100 and 39, Manoa, Pennsylvanian, Frances, Walter Barge No. 30, Charlie Watson, Gold King, Covena, Golden Hind, Foy Derrick Barge, Mitwo, Kentuckian, Tug Biddle, Damsterdyk, Tejon, Diana Dollar, Melville Dollar, Margaret Dollar, D. G. Scofield, Adamina, Brunswick, Hawaiian, Esther Johnson, Golden Star, President Lincoln, Kadiak, Vagabond, Golden Dragon, Oregon, Polarine, Hidalgo, El Aquario, Willsolo, R. M. Woodward, Golden West.**

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

DRYDOCK AND ROUTINE REPAIRS: **Two seaplanes, 1 scow, 10 fishing boats, 23 ship repair jobs not requiring docking, 32 commercial jobs.**

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Patterson** (Destroyer No. 392); standard displacement, 1500 tons; keel laid July 23, 1935; estimated completion date, February 1, 1937.

U.S.S. Jarvis (Destroyer No. 393); standard displacement, 1500 tons; keel laid August 21, 1935, estimated completion date, May 1, 1937.

Construction of **Destroyer No. 408, U.S.S. Wilson,** 1500 tons, keel not yet laid.

DRYDOCK AND ROUTINE REPAIRS: **California, West Virginia, Colorado, Ranger, Saratoga, Swallow, Mahopac, Tatnuck, Challenge, Wando, Aroostook, Jason, Kearsarge (Crane Ship), Patoka, Pawtucket, Prometheus, Pyro.**

STEPHENS BROS. BOATYARD

Stockton, Calif.

NEW CONSTRUCTION: **One 48'** cruiser, teakwood hull, equipped with Scripps 164-165 motors, for Marshall Dill, San Francisco.

One 36' cruiser, being built as a stock cruiser.

TODD SEATTLE DRY DOCKS, INC.

Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **Jason, Seattle, K. I. Luckenbach, Northland, North Sea, West Ira, Barge William Nottingham.**

UNITED STATES NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION: **Smith,** Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934, launched April 22, 1936.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935; to be launched early in 1937.

Pompano, Submarine (SS181); estimated delivery August, 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935.

WESTERN BOAT BUILDING CO.

Tacoma, Wash.

NEW CONSTRUCTION: **Keel No. 120,** Purse Seine Fishing boat. 87′ long, 23′ beam. 240 H.P. Atlas Imperial engine. Keel laid September 15. No owner as yet.

DRYDOCK AND ROUTINE REPAIRS: **Freight boat Seatac; fishing boats Wisconsin, Flying Fish, Britania, Valencia, Blanche.**

WINSLOW MARINE RAILWAY & SHIPBUILDING CO.

502 Burke Building
Seattle, Washington

DRYDOCK AND ROUTINE REPAIRS: **U. S. Coast Guard cutter Haida,** renewal of weather deck; approximate contract price, $28,000. **Texada**, renewal of hull and tank top plating, etc.; approximate contract price, $90,000.

Atlantic, Lakes, Rivers

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Contract for dredge hull to be built at Buffalo plant.**

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hull No. 160, **Lamson (DD 367)**, torpedo boat destroyer, for U.S. Navy; keel laid, March 20, 1934; launched June 17, 1936; **estimated delivery October 27, 1936.**

Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis and DD396 Jouett**; Three 1850-ton destroyers for U. S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively, **DD-396**, keel laid, Mar. 26, 1936. **DD395**, keel laid July 28, 1936. **DD394**, keel laid April 8, 1936.

Hulls Nos. 165 and 166, trawlers, single screw, steel, diesel propelled, for Boston, Mass., owners; **165 launched September 19, 1936.**

Hull No. 167, Ferryboat Aquidneck. Diesel electric ferry for U.S. Navy; estimated delivery, March, 1937.

Hull No. 168, Trawler, single screw, steel, diesel propelled, for delivery to Boston, Mass., owners, during December, 1936.

Hull No. 169, Trawler, single screw, diesel propelled, for delivery to Boston, Mass., owners in April, 1937.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA44, Vincennes,** 10,000 tons. Keel laid January 2, 1934; launched May 21, 1936; estimated delivery, January, 1937.

DD363. Balch, keel laid, May 16, 1934; **estimated delivery, Sept., 1936.**

DD-380. Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, January 1937.

DD-382. Craven, 1500 Ton Destroyer. Keel laid June 3, 1935.

CV7. Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated delivery, September, 1938.

Hull 1462, Triton, steel trawler; 350 H. P. **estimated launching, August, 1936; estimated delivery, September, 1936.**

Hull 1463, U. S. Army Hopper Dredge Goethals; 5000 cubic yards capacity; estimated delivery February 1, 1938.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers**—steam—425′x64′x34′ for Gulf Refining Co.; total tonnage 7070 each.

IRA S. BUSHEY & SONS, INC.

Foot of Court Street
Brooklyn, New York

NEW CONSTRUCTION: **Two 76′ all-welded diesel towboats** of 450 horsepower each.

One 90′ all-welded diesel towboat of 750 horsepower.

DRYDOCK AND ROUTINE REPAIRS: **Port Jefferson, Pilot Boat Sandy Hook, Tug Jos. Carroll, Diesel Tugs Central, Calatco, and Cayuga.** Cutting tanker **J. A. Cummings** in half and adding 20 feet in length.

CHARLESTON SHIPBUILDING & DRYDOCK CO.

Charleston, S.C.

NEW CONSTRUCTION: **One 60-ft. all-welded lighter** for stock. Rebuilt 6 lighters (wooden) for Chesapeake Corp.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION: **One 175′x34′ x10′ tender** for U.S. Lighthouse Dept. Two triple expansion steam engines; total horsepower 1000; keel laid July 1, 1936; estimated delivery, February 1, 1937.

One 115′ twin screw diesel yacht, 115′ long, 17′6″ beam; total horsepower, 450; **completion date, October 1, 1936.**

One fire boat for City of Chicago, 90′ 6″ long, 22′4″ beam; diesel power; pumping capacity, 7,500 gallons per minute at 150 pounds; delivery January 1, 1937.

THE DRAVO CONTRACTING CO.

Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hull No. 1266, one steel 20″ pipe line dredge for U. S. Engineer Office, St. Paul, Minn., of 1987 gross tons.

Hulls Nos. 1289-1291 inclusive; 3 welded "W-3" coal barges 175′ x 26′ x 10′8″; 1416 gross tons.

Hulls Nos. 1292-1295 inclusive; 4 welded flush deck cargo box barges 130′ x 30′ x 7′6″; 1000 gross tons.

Hull No. 1296, one welded cattle barge 196′ x 36′6″ x 8′ for Jersey City Stockyards; 1300 gross tons.

Hull No. 1297, one welded oil barge 110′ x 30′ x 11′ for Patterson Oil Terminals, Inc., Philadelphia, Pa.; 335 gross tons.

Hulls Nos. 1300-1309, inclusive; ten welded type W-3 coal barges, 175′ x 26′ x 10′8″; 4,720 gross tons.

Hull 1310, one welded steel coal barge, 134′ x 34′ x 16′, of 362 gross tons.

Hulls 1311-1313, inclusive; three riveted sand and gravel barges 100′ x 26′ x 6′6″, for Smoot Sand and Gravel Corp., Washington, D. C.,; 495 gross tons.

This makes a total of 25 hulls under contract, with a total gross tonnage of 11,706.

ELECTRIC BOAT CO.

Groton, Conn.

NEW CONSTRUCTION: **Hull No. 23, Perch,** S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; launched May 9, 1936.

Hull No. 24, Pickerel, S.S. 177 keel laid March 25, 1935; launched July 7, 1936.

Hull No. 25, Permit, S.S. 178, keel laid June 6, 1935; **estimated launching, October 1936.**

Hull No. 26, Salmon, SS182, standard displacement 1450 tons.

Hull No. 27, Seal, SS183, standard displacement 1450 tons.

Hull No. 28, Skipjack, SS184, standard displacement 1450 tons.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

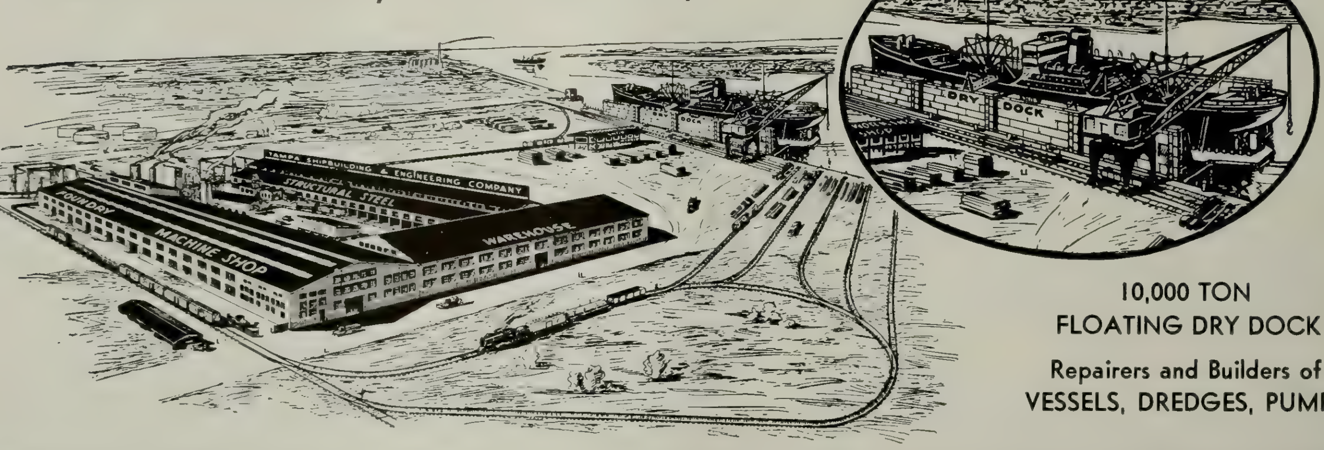
NEW CONSTRUCTION: **DD369 Reid,** destroyer for U. S. Navy; nearing completion.

Two destroyers, **DD381 Somers** and **DD383 Warrington;** keels laid June 27, 1935 and October 10, 1935, respectively; estimated launching, November, 1936 and January, 1937, respectively; estimated completion March 1, 1937.

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938; keel laid, DD397, September 1, 1936.

Two 12,800 ton tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; estimated completion dates October 1936 and December 1936, respectively.

TAMPA SHIPBUILDING & ENGINEERING CO.
Tampa, Florida
Structural Steel, Foundry Products, Machinery



10,000 TON
FLOATING DRY DOCK

Repairers and Builders of
VESSELS, DREDGES, PUMPS

PLANT: 19TH & GRANT STREETS — PHONE Y-1112 THIS DRY DOCK WILL BE READY FOR BUSINESS IN OCTOBER

Four 12,800-ton tankers for the Standard Oil Company of New Jersey; Isherwood Arcform design of hull form and longitudinal hull framing.

THE INGALLS IRON WORKS COMPANY
Birmingham, Ala.

NEW CONSTRUCTION: **Three oil barges** 125′ x 30′ x 7′; **three oil barges** 150′ x 30′ x 7′; for International Petroleum Co., Ltd. (Tropical Oil Co.) Toronto, Ontario; **estimated launching, September 19, 24, and 29, and October 17, 22, and 27, 1936;** estimated completion, November 5, 1936.

JAKOBSON & PETERSON, INC.
Ft. of 16th Avenue
Brooklyn, New York

NEW CONSTRUCTION: **One 88′ all welded steel tow boat** for Dauntless Towing Line of N.Y. To be powered with 650-H.P. Cooper-Bessemer diesel engine.

One 65′ all welded steel combination tow boat and tanker for the Lewis Coal & Oil Corp. of Port Washington, N.Y. To be powered with 300-H.P. Atlas Imperial diesel engine.

LEVINGSTON SHIPBUILDING CO.
Orange, Texas

NEW CONSTRUCTION: **One full model hull, all-welded diesel tug,** 55′ long, 14′ beam, 7′6″ deep; 120-horsepower Fairbanks-Morse marine diesel engine; for Atlantic, Gulf & Pacific Co., New York City.

One all-welded, steel derrick barge 50′ x 28′ x 5′3″, for Austin Bridge Co., Dallas, Texas.

One all-welded, steel ferryboat, length overall, 149′, beam over guards, 66′, beam molded, 54′, depth molded, 11′. Twin screw diesel electric. Two 350-horsepower Cooper-Bessemer diesel engines with Westinghouse generators and motors. For Algiers Public Service Corp., New Orleans, Louisiana.

DRYDOCK AND ROUTINE REPAIRS: **Lighthouse tender Larkspur,** installation of new boilers and general overhauling; cost $50,173.50.

MANITOWOC SHIPBUILDING CO.
Manitowoc, Wis.

NEW CONSTRUCTION: **One steel dump scow and one steel dry dock section** for Great Lakes Dredge and Dock Co., Chicago, Ill.

One steel dump scow for Fitzsimons and Connell Dredge and Dock Co., Chicago, Illinois.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, West Virginia

NEW CONSTRUCTION: **One sternwheel river steamer,** 200′ x 44′ x 5′6″.

Ten standard river coal barges, 175′ x 26′ x 11′.

MARYLAND DRYDOCK CO.
Baltimore, Maryland

NEW CONSTRUCTION: **Three steel covered lighters,** 120′ x 30′ x 8′, for the Merchants & Miners Transportation Company.

One steel, double ended, diesel electric ferryboat, for Norfolk, Va.

DRYDOCK AND ROUTINE REPAIRS: **Thomas P. Beal, Plymouth, Elizabeth and Hilton. Catherine** being completely reconditioned, and new fireproof passenger quarters and public spaces being constructed.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: Contract for three destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357),** launched April 18, 1936; **Hull No. 411, Winslow (DD-359)**; of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413 Nashville (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935;

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359 aircraft carrier CV5, Yorktown, for U. S. Navy;** keel laid May 21, 1934; launched April 4, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; **launched October 3, 1936.**

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; estimated launching, December 3, 1936.

H362, light cruiser CL49, St. Louis; estimated keel laying, December 14, 1936.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION: **Hulls Nos. 1064 and 1066—two steel hull towboats** building for Donaldson Towing & Lightering Co., Phila., dimensions: 95′ L.O.A. 88′ L.B.P. x 24′ x 14′ 9″; one Unaflow vertical marine type engine, two cylinders 25″ dia. x 20″ stroke, 130 R.P.M. 600 I.H.P. One Scotch type boiler 13′ 3″ diam. x 11′ 6″ long, 3 furnaces, 185 lbs. W.P. Estimated delivery, November, 1936 and February, 1937, respectively.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

NEW CONSTRUCTION: **One 60-foot iron hull,** all-welded V bottom boarding and fumigating vessel for U. S. Public Health Service; equipped with twin screw Superior diesel engines.

SUN SHIPBUILDING COMPANY
Chester, Pa.

NEW CONSTRUCTION: **Hulls No. 155-156.** Two single screw bulk oil tankers for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485'6"x68'0"x37'0"; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 155. Keel laying March 16, 1936; **launching Sept. 26, 1936; delivery Oct. 10, 1936.** Estimated dates for Hull No. 156. Keel laying March 16, 1936; **launching October 31, 1936;** delivery November 20, 1936. Estimated dates for Hull No. 157. Keel laying April 15, 1936; launching Nov. 28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511'x65'9"x37'; 15,800 tons.

Hull No. 160, 1 oil tanker (steam) 520'x70'x40' for Atlantic Refining Co.; 18,500 tons.

Hulls No. 161 and 162, steam tankers for Standard Oil Company of New Jersey; 422' x 65' x 35'; 12,900 dwt.

Hulls No. 163 and 164, diesel tankers for The Texas Company; 465' x 65' x 34'6"; 12,000 dwt.

TREADWELL CONSTRUCTION COMPANY

Midland and Erie, Pa.

NEW CONSTRUCTION: **1 steel gold dredge** (ladder type) **hull** 155'x70'x13' for South American firm.

1 barge 100' x 24' x 6' for Parsons & Rader.

Four barges 100' x 26' x 6'6" for Pittsburgh Gravel Co.

Two dump scows 93' x 22' x 8'10" for U. S. Engineer, Cincinnati, Ohio.

24 pontoons 48' x 16' x 2'6" for U. S. Engineer, St. Paul, Minn.

UNITED SHIPYARDS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION:

DD365, Destroyer Cummings, L.B.P. 334'; beam 35'; mean draft 10'10"; keel laid June 26, 1934; launched Dec. 11, 1935; **estimated delivery October 22, 1936.**

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched April 18, 1936; estimated delivery, December 9, 1936.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; **estimated launching, September 16, 1936;** estimated delivery, February 9, 1937.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267' overall, 66' extreme breadth, 19'9" depth; keels laid April 4, April 27, and May 1, 1936, respectively; estimated launching, November 17, December 8, and December 29, 1936, respectively; estimated delivery, January 19, Feb. 9, and March 2, 1937, respectively.

UNITED STATES NAVY YARD

Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case,** L.B.P. 334'; beam 35'; depth 19'8"; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, November, 1936.

Destroyer DD371, Conyngham, L.B.P. 334'; beam 35'; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, December, 1936.

DD389, Mugford, and DD390, Ralph Talbot, two light destroyers; LBP 334'; beam 35'6"; depth 19'8"; keels laid October 28, 1935; **launched October 28, 1936;** estimated delivery, April, 1937 and July, 1937, respectively.

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334'; beam 35'6"; depth 19'8"; estimated delivery, June and August, 1938.

UNITED STATES NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION: **U. S. S. Charleston,** gunboat (PG51) for U. S. Navy, building period assigned by Navy Department, Nov. 1, 1933, to Feb. 1, 1936; keel laid October 27, 1934; launched Feb. 25, 1936; **completed September 15, 1936.**

One **Coast Guard Cutter** (2000 tons). Keel laid Aug. 15, 1935; **estimated launching, Oct. 20, 1936;** estimated completion, January, 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD

New York, N. Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser. L.B. P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; estimated launching, November, 1936; estimated delivery May, 1937.

CL 48, **Honolulu,** light cruiser; L.B. P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching, January, 1937; estimated delivery October, 1937.

CL 50, **Helena,** light cruiser; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers; contract delivery, May 16, 1939.

PG. 50, **Erie,** gunboat; L.B.P., 308'; beam, 41"; standard displacement, 2000 tons; geared turbine engines; express type boilers. Building for U.S. Navy, keel laid Dec. 17, 1934; launched January 29, 1936; **estimated delivery, October 15, 1936.**

CG 69 and CG 70, **Alexander Hamilton and John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308'; beam 41'; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery January, 1937.

DRYDOCK AND ROUTINE REPAIRS: **U.S.S. New Orleans** scheduled for overhaul from September 1 to November 27.

UNITED STATES NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia,** L.B.P. 600'0"; beam 61',7¾"; molded depth at side to main deck amidships 42'0¾"; draft corresponding to normal displacement 21',8½"; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

Coast Guard Cutter No. 66, Samuel D. Ingham; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, September, 1936.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61' 9¾", depth molded at side to main deck amidships 42'0 3/8", draft corresponding to normal displacement 21'10"; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION: **SS 179 Plunger,** keel laid July 17, 1935; launched July 8, 1936; estimated delivery Feb., 1937; **SS 180 Pollack,** keel laid October 1, 1935; launched September 15, 1935; estimated delivery May, 1937.

SS185 Snapper, submarine; keel laid July 23, 1936; LBP 300'; beam 26'; loaded draft 15' 7"; diesel electric engines.

Pacific International Trade

Culled from Recent Reports of U.S. Department of Commerce and Various Other Sources

Trade Agreements "In a world given over to trade conflict which has all the elements of commercial war, trade between nations may in a few years be completely destroyed. With everyone throwing rocks at everyone else's commerce, something must be done to bring about a cessation of the conflict and the reestablishment of commercial peace. War of any kind is difficult to stop. It tends to reach a point of mutual attrition and ultimate exhaustion.

"The world depression accentuated international commercial conflict; and international commercial conflict has accentuated the depression. World trade, as represented by twenty-four leading countries, dropped from a high point of fifty-five billion dollars in 1929 to eighteen billion dollars in 1935. This was a drop of 67 per cent. In the case of the United States, our foreign trade fell off even more during the depression than our domestic business, indicating the price we have been paying for the destructive economic war which is gripping the world.

"Under the circumstances, the logical approach to this world-wide problem is clearly an effort to bring about the mutual cessation of hostilities. The trade agreements therefore seem to be a good place from which to begin.Trade agreements are based on the sound and fair principle of mutual trade concessions and undertakings to seek peace rather than to continue warfare. Therefore, aside from the mutual concessions to trade provided for in each of the fourteen agreements that have been consummated, there is a "treaty of peace." This treaty is the section covering the general provisions of the agreement. Under these general provisions, the two parties mutually undertake to treat each other's commerce fairly or on the basis of the unconditional, most-favored nation principle.

"To get concessions from another country for our export business in return for concessions given is not sufficient. There must be assurances of fair treatment for all our trade in exchange for fair treatment to all the other countries' trade. This phase of the trade agreements is of real significance, because it means that inroads are being made into the present destructive practices which are based on the granting of preference for preference.

"Many countries of Europe and Latin America have moved almost entirely away from the non-discrimination principle upon which trade thrived up until the time of the war, and have instituted the practice of preferential arrangements until the trade of the important countries of the world has become enmeshed in an extensive system of commercial coercion and pressure. In general, the technique of treaty arrangements is one of forcing other countries into granting preferential concessions. It must be obvious that, aside from the fact that this means commercial warfare, it defeats its own end because every preference means corresponding discrimination, and when discrimination is bought off by concessions, it is apt to take the form of discrimination against still other countries.

"Our fourteen 'commercial peace treaties' lay down the terms of fair practice and non-discrimination in regard to all the important forms of trade control, such as tariffs, quotas, exchange allocation, and government monopoly. These peace treaties are based on the principle that contraction of a country's commerce through contraction of its imports is its own affair, but that there must not be artificial diversion of business from one country to another. This movement has been commended by many leaders both in this country and abroad, who see in the trade agreements the beginning of an effort not only to increase the flow of world trade but to re-establish in the commercial relations of countries fair and sound principles. Without such principles world trade cannot expand.

"Our country has therefore not only shown world leadership in the only serious effort being made anywhere to re-establish world business, but has itself gained increased trade with the fourteen countries with whom agreements have been consummated, and with other countries who have shown a disposition to eliminate discrimination against our trade even though we have not yet consummated agreements with them."

[Extract from an address by Henry F. Grady, Dean, College of Commerce, University of California, before the Foreign Trade Association at San Francisco, September 21.]

General Conditions. In the countries bordering on the Pacific Ocean, conditions for international trade, with very few exceptions, are improving quite rapidly.

Practically all **China** is harvesting larger crops and getting better prices than for several years past. The national government is gradually establishing a more stable control of customs and receiving increased revenues. Through air mail service from China to the world's great commercial centers is being firmly established, and a letter now goes from Shanghai to London, Paris, or Berlin, in 12 days or less. For the first seven months of 1936, Chinas' imports totaled 534 million yuan, a decline of 12 per cent from 1935, and her exports aggregated 393 million yuan, an increase of 29 per cent compared with same period last year. United States led the world's nations in participation of this total trade, taking 29 per cent of the exports and shipping 18.4 per cent of the imports.

Copies of the Chinese cargo marking regulations, which become effective October 12, 1936, may be obtained on a loan basis from local offices of the Bureau of Foreign and Domestic Commerce. These regulations are somewhat lengthy, and cover the use of distinctive shipping marks on different types of commodities and packages and also the necessity of numbering individual packages consecutively. Failure on the part of shippers to observe the new regulations will result in penalties being assessed against importers in China. Since the regulations will be very strictly enforced, it is imperative that exporters familiarize themselves with all provisions of the new regulations.

Japan: The Government Reform Program was reduced and consolidated to seven principal policies, including, among others, encouragement of industrial development and electric power control, foreign trade expansion and control, and tax readjustments. Business is reacting favorably to policy announcements, which are less drastic than anticipated, while heavy government expenditures are expected to influence trade favorably. Export trade the second ten days of August increased 19 per cent and imports gained 40 per cent, compared with the same period last year. Leading commodity markets are not responding to the improved sentiment, with evidences of some price recessions. Japan Cotton Spinners' Association decided to maintain the present production curtailment rate of 26.2 per cent for the remainder of this year. Rice production is expected to be better than normal. The shipbuilding industry is showing a marked activity.

Japan's current pyrethrum crop, part of which has already been harvested, is estimated to be about 30,000,000 pounds, or approximately 22 per cent heavier than that of last year and about 75 per cent in excess of the 1934 output. Japan is the chief world source for this important insecticide material, which is used extensively in popular insecticide sprays, and the United States is the outstanding market, taking around 95 per cent of the 17,000,000 pounds exported from that country last year.

Philippines: Export trade in July increased 3 per cent and imports declined 14 per cent, compared with the same period last year. Increased imports of tires, printed matter, and cotton manufactures, except cotton piece-goods, were not sufficient to offset declines in imports of automobiles, cotton cloths, iron and steel, and mineral oils. The larger export value is due to heavier abaca shipments. A bill introduced into the National Assembly would increase excise taxes on petroleum products.

The National Assembly has passed a bill creating a Fair Trade Board to prevent and restrict unfair methods of competition and deceptive practices in commerce, according to a radiogram from Trade Commissioner J. Bartlett Richards, Manila. The Public Works Committee has approved a bill setting aside 5,000,000 pesos as a revolving fund for the construction of water systems.

The copra market is very strong, prices having risen during the past week to 12.50 to 13 pesos per 100 kilos (220 pounds) for warehouse grade resecado, Manila; Cebu, 12.30 to 12.60; Legaspi and Hondagua, 12.10 to 12.30 pesos. (Peso equals $0.50.)

Netherlands India: While improvements in economic conditions during the past two months are largely the result of seasonal factors, the general economic situation is much better than a year ago.

Favorable factors include rising prices for vegetable oils and oil-bearing products, better prices for tapioca because of the American drought, improvement in quotations for hides and skins, essential oils, and gum damar, steady demand for rubber in world markets, and activity in the sugar industry.

The yields of native food crops in Java have been exceptionally high, coin circulation is on the increase, amusement tax receipts are greater, and retail sales to the natives have increased. The credit situation improved somewhat in July, because of easier collections from dealers following the availability of surplus cash from crop returns. These and various other economic indexes point to a gradual improvement in the status of the native population in recent months. Following 6 or more years of continued depression among the native population, this trend, if continued, may be expected to lead to greater consumer demand.

Exports of rubber in July were the highest since May, 1935, totaling 34,354 metric tons, of which 18,288 were native rubber. The special export tax on native rubber was raised to 37 florin cents on August 2, in order to check native production, which had reached a new high level.

Foreign trade of Netherlands India for the first half of 1936 increased slightly in value, compared with the same period last year. An advance of 20,500,000 florins in exports, which amounted this year to 255,890,000 florins, was partially offset by a decline of 6,835,000 florins in the value of imports, which totaled 129,020,000 florins. (The florin averaged $0.6765 in United States currency for the first half of 1935 and $0.6806 in 1936.) On a volume basis, both exports and imports were lower, the former aggregating 4,561,700 metric tons, compared with 4,712,860 tons last year, and the latter amounting to 788,800 tons, against 852,660 for the first half of 1935.

Australia: There are several reasons why the outlook for business is more favorable at this time. In the first place, the maintenance of funds of Australian banks in London and bank reserves are about on a level with the position of a year ago, in spite of earlier fear of depletion. In the second place, there has been a gradual increase in and favorable outlook for export prices, aside from wool values, and, at the same time, there has been increased evidence that high prices will be realized for the wheat crop now growing. Another factor is that seasonal conditions have seldom been better, and are at present rated from good to excellent in all States, thus practically assuring a high volume of production for major crops.

Banks still continue a fairly conservative policy regarding advances, in order to maintain and build up their reserves.

The export index for the first half of August stood at 820, as compared with 782 for July and 684 for a year earlier. Construction activities are being well maintained at the high levels of recent months. The steel production of one large company for the four weeks ended August 2 established a new high record at 56,000 tons, as compared with 45,000 for the like period of 1935. Pig-iron production by the same company reached 52,000 tons, against 36,000 a year earlier. It is reported that £A700,000 are to be spent immediately in completing the Sydney City Railway.

Business clearings at banks in Melbourne and Sydney, from July 13 to August 10, amounted to £A109,000,000, as compared with £A89,000,000 for the comparable period of last year.

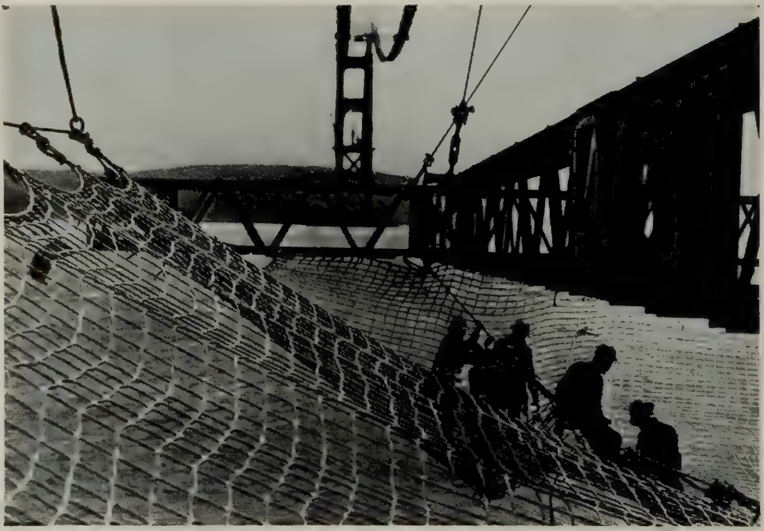
Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ BERNARD De ROCHIE, LOOK-OUT MAN

● Tubbs Rope is Selected for World's Greatest Safety Net

Under the Golden Gate Bridge, a net 120 feet 6 inches in width is being built from ⅜-inch manila rope, 3,500,000 feet of which were supplied by Tubbs Cordage Company. It is built in two parts, a traveling section and a permanent section, the former constructed under the point at which the latter erection is being done; it is attached to a heavy metal frame carried on wheels and rides on the upper member of deck truss, moving along as the truss is constructed. Sections of the permanent net will be carried on the land end of the traveling section and let out as work progresses, thus leaving a continuous section of safety net extending from each land end toward the middle, until eventually it will meet in the center.

Tests have proved very satisfactory, and it is hoped that construction of the bridge will break two world's records — building of the longest span, and no loss of life during construction.



● New Commander

Captain Harold L. Winslow is the new commander of the Panama Pacific liner Pennsylvania, a position he well merits after his many years of service at sea. He was born in Quincy, Massachusetts, first going to sea as a cadet in the Massachusetts National Training School, after which he joined the Navy.

It was after the war when Capt. Winslow entered the merchant service, working up through various ratings as an officer in the United States Lines until he became chief officer of the Leviathan and then of the Republic. Later he served in the intercoastal trade as chief officer of the Virginia, leaving this berth to take over his first command, the liner New Orleans, of the Roosevelt Steamship Company. He was then transferred to the American Merchant Lines' Service to England, having three commands with this company, then he went back to the U. S. Lines as master of the President Harding, which he has just given over to Captain James E. Roberts of the Pennsylvania in order to command the latter ship.

Captain Winslow is 43 years old. He was married about a year ago, and makes his home in New York City.

● Drew Chidester Returns

Back in San Francisco again is **Drew Chidester,** vice president and general manager of the General Steamship Corporation, who has been vacationing all over Europe and the Continent with Mrs. Chidester. They left here with the intention of returning in a couple of months, but found the foreign countries so interesting that they prolonged their visit to five months.

● Pennsylvania's New Purser

There's a new purser on the Panama Pacific liner Pennsylvania — **John A. Lock,** former purser of the old American Line, who several years ago, while serving on the Belgenland, visited California ports and fell under their spell. Recently he was transferred from the President Harding at his own request so that he could visit our ports again. Twenty years ago, Lock was purser on one of the last of the American liners, the Philadelphia, and is well known for his ability to entertain the passengers on his ship.

Coals to Newcastle. A Japanese food canning company is now canning sauerkraut, manufactured from Japanese grown cabbage, and shipping the product in considerable quantities to Hamburg, where it competes in price and flavor with the home product.

More Linen for America. One indication of the return of prosperity in this country is the fact that there was a 20-per cent increase in the imports of fine North Ireland flax and linen products during the first eight months of 1936, as compared with the corresponding period in 1935.

A recent passenger on the Panama Pacific liner Pennsylvania was **Albert De Smedt,** assistant vice president of the International Mercantile Marine Company, who is making the voyage on his tour of inspection in connection with the operation of passenger service on Panama Pacific ships. De Smedt has a reputation for exact knowledge of shipboard conditions contributing to the comfort of passengers, and is official detail man of the operating department.

The Lurline, express liner of the Matson Line, has a new chief officer—**H. O. Matthiesen,** U. S. Naval Reserve, former first officer of the ship, which berth he had filled ever since her entry into service. Prior to that time, Matthiesen was second officer on the Malolo. He succeeds **G. R. Munro,** who remains for shore duty.

Courtenay T. Lindsay, who has been well known to shipping and railroad men throughout the world as the receiving and forwarding agent of the Panama Railroad Company, with headquarters at Cristobal, was recently promoted to the position of general manager of that railroad, and assumed his new office on September 1. As operating head of the road and the auxiliary services it renders to shippers, Lindsay succeeds **Robert Braxton Walker,** who died on August 16, after 30 years' service with the Panama Railroad Company.

● Shipowners Association Elects Ralph Myers

Newly elected president of the Shipowners' Association of the Pacific Coast is **Ralph W. Myers,** of Hobbs, Wall and Company, succeeding **Frank J. O'Connor,** who is retiring from the position after 15 years as head of the coastwise operating organization.

Pacific Marine Review joins his many friends in wishing the new helmsman a successful voyage.

The Board of Directors named at the recent election-meeting is comprised of: S. D. Freeman, S. S. Freeman and Company; L. C. Stewart, Sudden and Christenson; J. A. Lunny, McCormick Steamship Company; R. C. Robinson, Hammond Shipping Company; W. R. Chamberlin, Chamberlin Steamship Company; Otis R. Johnson, National Steamship Company; H. F. Vincent, E. K. Wood Lumber Company; J. L. Reed, J. R. Hanify Company; A. J. Nolan, P. L. Transportation Company; George F. Grant, Coos Bay Lumber Company; Whitney Olson, Olson Line.

Everett Chapman, new president of Lukenweld, Inc.

The appointment of **S. J. Garahan** as manager of sales for the cable section of the General Electric Company's central station department has been announced by **F. H. Winkley,** manager of the lighting and cable section. **R. G. Bellezza,** former head of the cable section, has become associated with the Locke Insulator Corporation, of Baltimore, Maryland, as vice-president and manager of sales.

Garahan entered the General Electric Company service in 1904 as an employe in the shipping department of the Schenectady Works. In 1909 he was transferred to the wire and cable department, becoming assistant to the head of the cable division in 1923. He was placed in charge of cable quotations in 1929, and later was appointed assistant manager of cable sales.

● Everett Chapman Heads Lukenweld, Inc..

Everett Chapman, formerly vice president of Lukenweld, Inc., Coatesville, Pennsylvania, has been elected president of the company, succeeding **G. Donald Spackman,** who was recently promoted general superintendent of Lukens Steel Company. **Robert J. Whiting,** former superintendent of Lukenweld, Inc., has been elected vice president.

Chapman joined the Lincoln Electric Company, Cleveland, in 1925, and in 1930 went with Lukenweld as director of development and research, subsequently being elected vice president, which post he held until his election to its presidency. He has been credited with the responsibility for Lukenweld's achievements in the design and application of welding to dynamically loaded structures such as diesel engine crankcases, railway trucks, etc.

Whiting, after many years' experience with Pickering Engineering Company, Ford Motor Company, and Fisher Body Corporation, joined the Lukenweld organization as superintendent, in which capacity he served until his election as vice president. He will continue in charge of all phases of manufacture.

The appointment of **F. B. Cooke** as general manager of the Canadian Australasian Line at Vancouver, B. C., was recently announced by Sir Edward Beatty, president of the line. Cooke, whose appointment became effective on September 1, succeeds the late J. C. Irons, who passed away a short time ago. He has had many years of experience in transportation, serving at the head office of the Union Steamship Company at Wellington, N. Z., and for four years in Vancouver, besides twelve years spent at sea.

Getting tired of being a bachelor, **Ben Hauschild,** general passenger traffic manager on the Coast for the Hamburg-American Line and the North German Lloyd, left recently for Germany, to bring his wife and family back to San Francisco. The latter have been sojourning in Germany since last May. Hauschild has another very good reason for wanting to join them — he and Mrs. Hauschild will celebrate their silver wedding anniversary while in Germany.

Propeller Club of California Hears Maritime Laws Analyzed

Captain W. J. Peterson, of the Pacific American Steamship Association, guest speaker at the September 15 luncheon meeting, spoke pertinently on "Maritime Legislation passed by the 74th Congress."

"A momentous Congressional session . . . with laws enacted that will exert a profound impression upon American shipping."

Capt. Peterson gave us a detailed analysis of the highly important Ship Subsidy Bill. Many attempts were made to enact the bill, and only in the closing hours of the session was it finally passed and then signed by the President.

"No one was completely satisfied with the bill, but a bad bill under good administering may work out well in the end, and the character of the personnel of the new Maritime Commission will determine how good or bad the bill may prove. It is hoped that no mere political appointments will be made."

The speaker pointed out that the Maritime Commission will be comprised of five members—no three of the same party—no regional requirements . . . shall serve six years, devoting full time to the duties of the Commission.

"They shall take over the duties of the Shipping Board along with the Board's powers under the Merchant Marine Acts of 1916, 1920, and 1922 . . . and the Intercoastal Shipping Act of 1933.

"The Commission shall make a survey of existing tonnage and trade routes, determining what new ships and replacements are required, and to provide for the best, safest and most suitable vessels manned by an efficient citizen personnel . . . in order to carry a substantial portion of our foreign imports and exports and to act as naval auxiliary in times of national emergency."

Capt. Peterson, who has spent several years at the nation's capitol, told of the constant vigilance required to keep posted on the various and sundry bills brought to Washington for the consideration of Congress. He gave examples of some of these proposals "born in the hysteria of the Morro Castle disaster which, if taken seriously and enacted into law, would have meant bankruptcy for many operating companies.

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JOSEPH J. GEARY

Secretary-Treasurer
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Headquarters

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C. M. Le COUNT
FLETCHER MONSON

"One of the hardest battles ever waged in Congress was the fight over the attempted repeal of the 4th section of the Interstate Commerce Act.

"Another hard fight was the attempt to amend the Panama Canal Act and to increase transit toll collections on commercial ships."

Other acts enacted by this session included the Carrying Goods by Sea, The Picketing Act, Extending Admiralty Jurisdiction to Chinese Courts, the International Convention of Safety of Life and Property at Sea, etc.

Under the new Internal Combustion Engine Act, motorships over 300 tons come under the same inspection rules as steam vessels, and engineers of Diesel vessels are under the jurisdiction and examination of the Steamboat Inspection Service.

Speaking of new Load Line legislation, Capt. Peterson termed this as the best regulation of any country.

● The Dangerous Cargo Act

The carriage of dangerous cargo is now under the supervision of the Board of Supervising Inspectors, Department of Commerce . . . . giving them power to make necessary safety rules, to approve the design, construction, repair or alteration of such vessels that carry liquid fuel in bulk.

The Act does not make provisions concerning the carrying of liquid cargo in the interstate and foreign trade if such vessels are already under the authority of the I. C. C.

● Changes in the Bureau

A new law sets up a marine casualty board of three members "to investigate all marine casualties involving loss of life."

Full power is vested in the Secretary of Commerce to try any licensed officer or holder of a seaman's certificate for any and all kinds of misconduct, inefficiency, or violation of marine statutes, and to provide the necessary penalties.

● Shipboard Discipline

This authority to maintain discipline is a new departure from existing laws. A Board of ten principal traveling inspectors will form a field service in the Bureau of Marine Inspection and Navigation. These inspectors to have full knowledge of the duties of licensed officers and seamen. The Act also gives authority to the Department of Commerce to pass on all new ship construction. A certificate of inspection is required by the Bureau before construction or alterations are permitted.

● The Seamen's Act

Terming this new legislation "the most outstanding and most far-reaching in its effects—insofar as ship personnel is concerned," our speaker carefully analyzed the Seamen's Act. Under this law, every seaman, after December 25, must secure a new certificate after an examination of his qualifications . . . he must take an oath to obey the laws of the country and to obey the commands of his officers.

Any seaman who has not secured his certificate, or who has had his certificate revoked or suspended, will not be permitted to go to sea.

Any owner or master who permits a seaman to ship aboard without a certificate will be subject to a serious fine.

A Continuous Discharge Book, containing photo, description and personal data of the seaman, will be maintained by the Bureau. The shipowner will not be permitted to issue any book of like character.

● Coast Guard Jurisdiction

Amending the present Coast Guard regulations, a new provision gives this department power and authority to police these several laws of inspection, certification, examination, etc.

A great job you are doing, Captain Peterson—and more power to you! As Chairman Harms stated: "Hope to have you back again."

● September 29

Too late for reviewing in this issue, the next luncheon meeting of the Club promises to create a great deal of interest.

Warren H. Pillsbury, of the United States Employees Compensation Commission, a very able speaker, will address us on the subject "Federal Interest in Maritime Accident Prevention."

THE 1936 MARINE SAFETY CONTEST

Based on reports received to date for the freighter division, the States Line and Matson Navigation Company (the former with only one vessel reporting and the latter with only three reporting) have perfect no-injury records. The Pacific Atlantic, with six vessels reporting, is in third place. The average for the Freighter Division is 10.65 reportable injuries for 100,000 man-hours worked.

In the Passenger Division, the States Line is leading, with two vessels reporting perfect scores; the Matson Navigation Company is second; and the Dollar Steamship Lines a close third. The average for this group is 2.20 reportable injuries per 100,000 man-hours worked.

In the Steam Schooner Division, out of the nine companies reporting there were four companies with perfect scores. They are: Hobbs, Wall & Co., McCormick No. 3 Fleet, McCormick No. 4 Fleet, and the P. L. Transportation Co. McCormick No. 1 Fleet is in fifth place. The average for the Steam Schooner Division is 6.50 reportable injuries per each 100,000 man-hours worked.

The following reporting vessels worked the entire month without any disabling injuries to a seaman:

Freighters

*San Anselmo
*San Clemente
San Felipe
*San Lucas
San Rafael
*New York
*Point Caleta
Point Chico
*Point Clear
*Point Judith
Point Palmas
*Point Vincente
*Admiral Laws
Admiral Gove
*Admiral Senn
Admiral Wiley
*Manoa
*Makawao
*Makua

Passenger Vessels

*General Pershing
*General Sherman
Emma Alexander
Malolo
*President Cleveland
*President Van Buren
*President Hayes

Steam Schooners

*Scotia
*Elizabeth
*Wapama
Castletown
*Eureka
*Watsonville
Point San Pedro
*Point San Pablo
*Peter Helms
West Planter
*West Shipper
*C. L. Wheeler, Jr.
*Silverado
*Wallingford

*Vessels marked with an asterisk went through the month without even a reportable injury.

The contest closes on December 31, 1936.

VACATION REFLECTIONS

● **We asked Joseph J. Geary for 25 words. Here's what we got!**

Bern De Rochie, Esq.,
c/o The Pacific Marine Review,
500 Sansome Street,
San Francisco.

My dear Mr. De Rochie (Bernie to you!):

This will acknowledge receipt of your letter of the 16th inst. asking me for a twenty-five word "squib" relative to "about where I vacationed and how I fared."

A review of the Webster International Dictionary defines vacation as:

"An intermission of a stated employment" or "a period of leisure or rest."

Judged by this standard I had a very thrilling vacation at an "extremely high-class" resort maintained by the TWA (otherwise yclept The Lindbergh Line). The interesting thing about this estimable organization is that its altitude varies with each succeeding hour, the scope of the variance being between sea level and anywhere up to 14,000 feet. Furthermore, another interesting episode in this organization: they give you just two meals before they throw you out. Flying during the night hours from New York to San Francisco, via Glendale, I lost about 5½ pounds and ruined a good shirt by reason of the dye from my necktie "leaking" around the collar band. All of which establishes that I was "up to my neck". That, in substance, doesn't spell vacation; it in reality bespeaks a ruination of one.

However, I presume that I should not be complaining, because the ride down to the office on the street cars in the morning was indeed extraordinarily restful, and the lowing of the kine and the cackling of the chickens from the Laguna Honda Home formed that interesting country background which is essential to the average dweller of the metropolitan area.

I've still got a vacation coming to me, and if you or Jimmie Hines can utilize a good sleuth (accompanied by the ubiquitous photographer) to attend the environs of Hollywood for the purpose of picking up "cheese cakes," I am open for engagements from 5 p.m. until 9 a.m.

Yours sincerely,
Joe Geary.

● More Vacation Reflections

Edward Harms, of McCormick Steamship Company, made out very, very well, we'd say. Listen: "Spent two weeks camping out at Sequoia National Park. Did practically nothing and had a swell time doing it. Just a little swimming and horseback riding. Camped by a river, and the nicest part of the vacation was to look at some water without any boats on it for two whole weeks."

Shed a tear with **Carrol Reeves,** of De Laval Steam Turbine Company. He writes: "What's a vacation? I haven't been exposed to one for so long, I forget!"

W. Edgar Martin, of Westinghouse, pre-flects: "Mine will be a fall vacation to the Northwest. The activity in new turbines, motors, etc., going round and round, has kept me moored to the desk all summer."

George E. Swett practically broke our hearts with this: "My 'vacation' so far this year has been a **four-month** sojourn on Federal jury duty. There is nothing like spending one's vacation at Government expense—and the opportunity of meeting such talented people en route to Alcatraz, McNeil, or what have you?

"I sure know all the answers, excepting where to go on my next vacation(?)."

● At the September 18th meeting of San Francisco's Navy Day Committee

Commander Francis R. Shoemaker reported that the pageant has been tentatively set for Sunday, October 25, between 11:00 A.M. and 1:00 P. M. The police and fire departments have promised to send details; and efforts are now being made to interest the Chinese Chamber of Commerce, California Historical Society, Native Sons of the Golden West, and Native Daughters of the Golden West, in the pageant.

Major C. C. Bradley reported that plans for Navy Day in Stockton are rapidly taking shape, and that the celebration promises to be an excellent one.

Captain L. M. Edelman announced that there will be a marine events program on Saturday, October 24, consisting of sailing races and pulling races (probably three heats); and that on Sunday, October 25, three sea scout ships will row off a tie.

Admiral E. H. Campbell spoke of his pleasure at the progress of the Navy Day celebration plans, and of his appreciation of the fine work being done by the committee.

Captain S. E. Allen reported for H. Gelhaus that the Pacific Steamship Owners' Association, the Pacific Tank Ship Owners' Association, the Pacific Ship Owners' Association, and other organizations in the merchant marine, would participate in the Navy Day program.

Naval cadet ship to visit coast. The Argentine full rigger Presidente Sarmiento.

● McCormick offices send us this interesting news:

The Argentine Naval Cadet Ship, the Presidente Sarmiento, will visit San Francisco and Los Angeles early in November, according to advices from Buenos Aires. The ship, now on its 37th voyage of instruction, is a three-masted, full rigger of 2,850 tons, and during her years of voyaging around the world has covered one million miles.

The vessel sailed from Buenos Aires on August 22 under Commander Francisco J. Clarizza, with a full complement of officers and cadets. Her itinerary will bring her to Los Angeles about November 1 and San Francisco on November 11. From San Francisco, the vessel proceeds south via the Panama Canal and Puerto Rico.

The Presidente Sarmiento, built in Birkenhead, England, in 1898, is 251 feet long, 43 feet beam, and 23 feet deep. Her mainmast has an overall length of 172 feet. The total number of officers, cadets, and crew comprise 302 persons, including 28 cadets. Three 4-inch guns are carried, one 4.7-inch and 6 six-pounders. The vessel has engines totaling 2,800 horsepower, permitting a maximum speed under power of 12 knots. Under power she has a radius of 4,500 miles at a speed of 10 knots.

While on the Pacific Coast, the cadet ship will use the facilities of the McCormick Steamship Company, operators of the Pacific Argentine Brazil Line, which pioneered the important trade route between the Pacific Coast and Argentina.

The Kelvin-White Company, for many years located at 112 State Street, Boston, have moved their offices and salesrooms to larger quarters, at 90 State Street. In their new corner location, added window-display space and greater floor space for merchandise give opportunity to arrange the marine instruments and other items to better advantage for visitors.

Wilfrid O. White, of Kelvin-White Company, is known throughout the yachting and marine world as the inventor of the Kelvin-White spherical compass, used on thousands of pleasure and commercial craft in all waters of the world today. He has also contributed many valuable refinements to nautical instruments used by all kinds of mariners, from sailors on small pleasure craft to the first officers of ocean greyhounds.

PACIFIC MARINE REVIEW

NOVEMBER 1936

San Francisco's Traditional Ferry Lanes are Transformed

Photo Courtesy Standard Oil Co.

Official Organ

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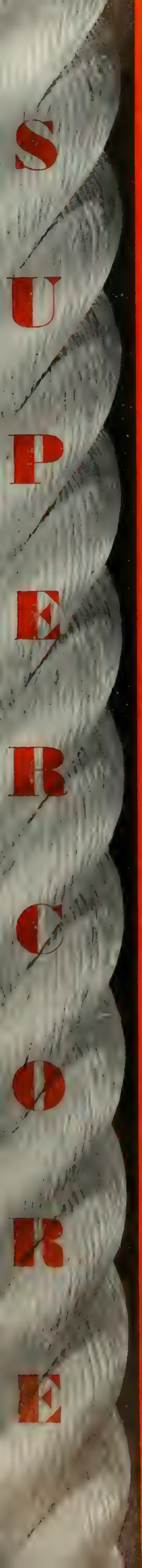
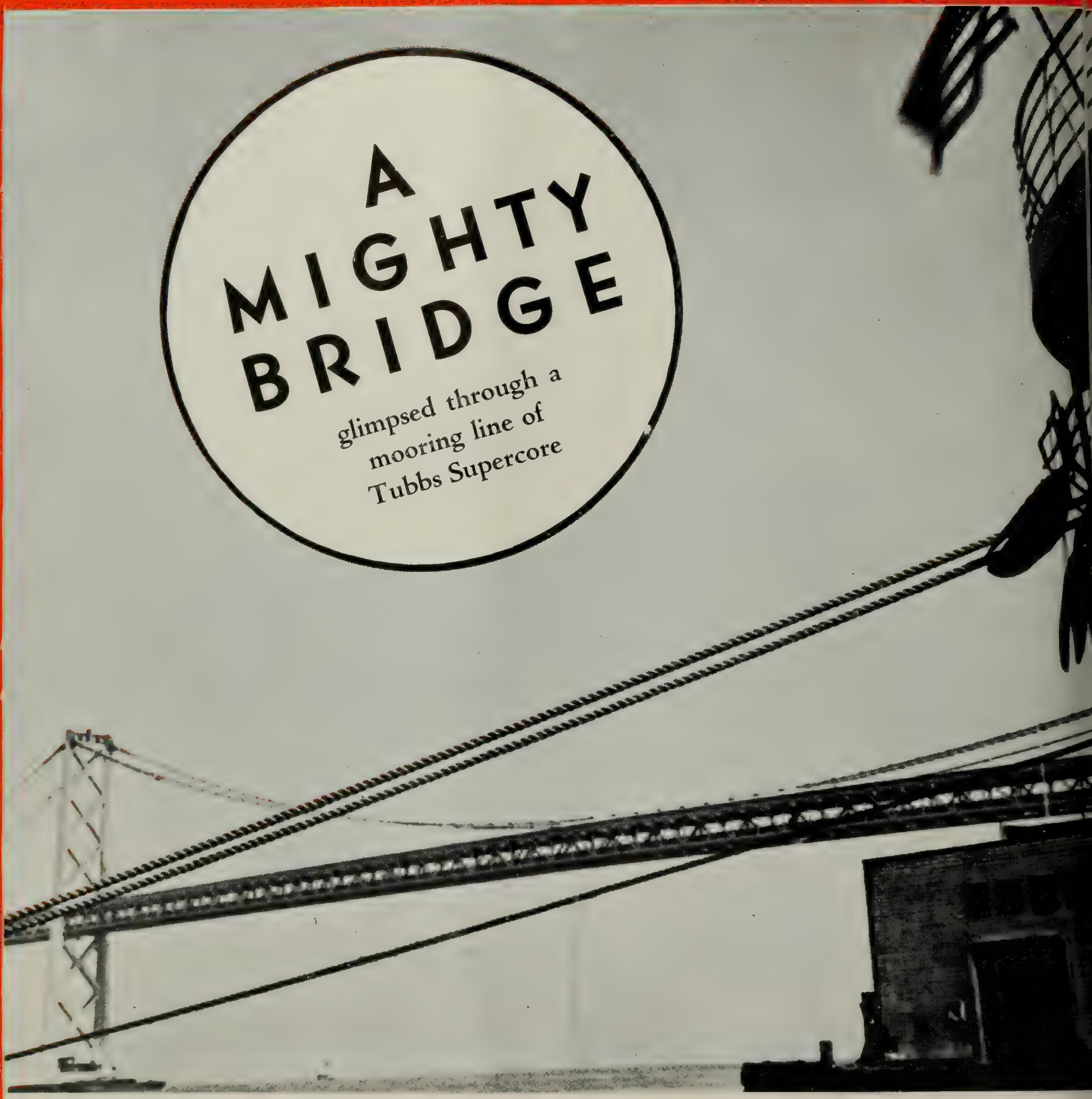
Steamship Association

Shipowners Association
of the Pacific Coast





Within a few days this greatest of structures—the San Francisco-Oakland Bay Bridge—will be formally opened—a worthy tribute to modern engineering genius.

It is significant that we should glimpse this great bridge through lengths of Tubbs Supercore mooring line. For just as Tubbs Rope plays such an important part in the Marine field so, too, was it used exclusively in the construction of the Bay Bridge.

When you select Supercore for mooring lines, tow lines of other heavy duty Marine work, you know you have picked the strongest, most dependable rope that money can buy. The patented construction of Supercore can be used in no other rope. Because the fibre is laid parallel instead of twisted, internal wear and friction are eliminated. The rope works as a unit, giving longer wear and greater strength and, in addition, makes a rope that is far easier to handle, wet or dry.

Don't take chances with just ordinary rope. Insist on Tubbs Supercore and watch quality go up while costs come down.

Tubbs Cordage Company

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Mills in San Francisco

Supercore licensed under Whitlock Patents June 23, 1925; October 20, 1925; August 3, 1926

PACIFIC MARINE REVIEW

NOVEMBER, 1936
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PACIFIC MARINE REVIEW

VOLUME XXXIII NOVEMBER 1936 NUMBER 11

Editorial Comment »« »«

A Problem in Transportation Economics

Many Pacific Coast citizens must view with alarm the utterly disorganized condition of our intra and interstate coastwise shipping. During the past two years this important department of our American Merchant Marine has almost disappeared, so far as the Pacific Coast is concerned. The reasons are not hard to find, nor are they very complex. More intense competition by truck and train, with store-door delivery, has cut largely into the business. That, undoubtedly, is one reason. But far more important than that is the tremendous increase in costs imposed by the maritime labor unions of the Pacific Coast.

Few citizens realize that the item of longshore labor cost is the largest expense item in ship operation. This fact is particularly true of ship operation on coastwise runs, where the stops are frequent and the ocean runs short. Analysis made in 1925 to 1930 indicated that in coastwise runs the longshore labor payroll at that time absorbed as high as 40 per cent of the freight earnings. In those days the coastwise ships were not paying any dividends to their stockholders, but were able to meet their payrolls.

The 1934 award to longshore union labor not only increased the pay per hour and shortened the working day, but it also specified, on practically every commodity, smaller sling loads than had previously been standard practice. The spirit of this award was wholly along the line of putting more men at work. This object is a worthy object at any time, but overdone it leads to "soldiering" on the job, so that the job requires more men. The total result of all this is that stevedoring costs at Pacific Coast ports have gone up by more than 50 per cent, and pilferage and breakage have increased tremendously.

Analysis of one Seattle-Portland-San Francisco voyage early in 1936 shows a stevedoring cost equivalent to 87 per cent of the freight earnings. With such an exhibit, it is perfectly obvious to any thinking man that coastwise shipping is being strangled by the longshoremen. And it must also be obvious that the other departments of our merchant marine will be strangled in the same way by the ever-increasing demands of maritime unions. These demands have been termed "insane" by the greatest leaders of marine union labor in America.

Pacific Coast longshore labor, under its present setup, is leading the maritime unions up a blind alley. It is already afoul of the new Safety at Sea law. It loudly declares any impartial investigation to be biased. It refuses, in advance of arbitration, to accept any arbitration award which does not comply with its demands. Its present demands would make American coastwise and intercoastal operation an economic impossibility for American cargo ships, unless those ships are built or rebuilt to designs that could load and discharge cargoes with a minimum of longshore labor.

From the viewpoint of the mechanical engineer and the material handling expert, present methods of handling commodities at seaport docks are very inefficient and extremely obsolete. If the unions insist on taking all the profits out of the steamship business, then that business will have to reorganize its staff and equipment to get along with a minimum of labor on board ship and in port.

The American marine unions had better be a little careful lest they work themselves right off the end of the yard arm.

The Federal Register

Every American ocean shipping operator, and every citizen of the United States whose business touches interstate matters, should subscribe to and keep a file of the daily Federal Register.

This sheet is a new publication, one of the latest effusions of the New Deal. It is still in its first volume and in the 160's as to serial number. We do not advise subscription because of the neatness of the format, the modern motif of the type face, or the beauty of the illustrations. All these attributes of the up-to-date publication are conspicuous by their absence. We are simply advising you that a careful reading of the Federal Register is the only economical way by which you can keep informed of all the moves of the new and old departments, bureaus, and commissions at Washington that are constantly making new decisions and changes in old decisions on matters affecting American business.

You will find, in many of the rules set up with the force and effect of a law, a clause by which these rules may be canceled or changed merely by a single publication in the Federal Register. You will find in that sheet every executive order of the Chief Executive and all the assistant executives. Every set of rules issued by departments for the administration of the laws affecting their activities. Every official edict of every department of the Federal Government is covered daily.

It can be obtained for $1.00 per month or $10.00 per year, post free, from the Director of the Division of the Federal Register, the National Archives, Washington, D. C. Get it and read it so that you may know what the government is doing to and for your business and that of your customers or your competitors.

Pacific Marine Twenty-Five Years Ago

On November 20, 1911, there was issued at Seattle Number 11 of Volume VIII, Pacific Marine Review, "First Established and Only Exclusively Marine Paper Published on the Pacific Coast."

The lead article was an address by Mr. Frank Waterhouse before the transportation men of Seattle on the occasion of a dinner at the Arctic Club on October 25, 1911, the subject being "Puget Sound's Foreign Commerce." The substance and conclusion of this address, boiled down to a single key sentence, would be: *"For the present conditions we need more commerce—not more ships."*

Declared the editor: "No other boiler works on the Pacific Coast north of San Francisco is so completely equipped for the quick and economical manufacture and repair of boilers of all kinds as the Commercial Boiler Works, located at 53-81 Landor Street, East Waterway, Seattle."

Reviewing the book "The Western Gate," written by P. H. W. Ross, of Ellensburg, Washington, and published by Dodd, Mead and Company, New York, our editor waxed enthusiastic over the grandiose scheme of the author, who proposed making the whole of the State of Washington, west of the Cascade Mountains, a free port or free foreign trade zone, which should be the Western gate for America's contact with the Orient in international trade. Under the inspiration of such a vision, our editor bursts into apostrophe. Cries he:

"Awake, America! Awake from your Alpine provincialism! Wide as your lands are now, awake and know what a wider world awaits your guidance—know that you cannot escape the white man's burden!"

Under personals appears notice of: The appointment of Captain C. D. Neroutsos as marine superintendent of the British Columbia coastwise services of the Canadian Pacific; the appointment of Marcus Talbot as general manager of the Port of Portland Commission; and the formation of Ballinger, Battle, Hulbert, and Shorts, as a new law firm in Seattle.

The associate editor, Captain E. Francke, began a series of heavy editorials directed at "Our Navigation Laws and Their Defects." The text and opening paragraph for this series was a pronouncement by the great Jim Hill, taken from a letter written by that railroad tycoon to Pacific Marine Review, reading:

"No other part of our governing code is so antiquated, so far behind the regulations approved by the rest of the world, so unfit to meet modern conditions and so utterly hostile to the development of the American merchant marine as our present system of navigation laws. There should be not only a thorough reform of these laws, but also a change in the attitude of the government towards all transportation interests before we can hope to restore the American ocean carrying trade."

On October 1 the steel barge Edward E. Green arrived at St. Louis, Missouri, with a cargo of barley shipped by water from San Francisco via Panama Railroad and transferred to the barge at New Orleans. This shipment was said to be the first by water from Pacific Coast to Middle West. The saving over rail rates was $3.50 a ton.

Our review of the freight market shows 18 charter fixtures, of which thirteen were sailing ships, as follows:

Barmbek, German bark, 2,108 tons, Portland—Cork;
Taurus, American schooner, 514 tons, Grays Harbor—Valparaiso;
Blakeley, American schooner, 630 tons, Puget Sound—Valparaiso;
Echo, American bark, 650 tons, Grays Harbor—Callao;
Alpena, American schooner, 833 tons, Pacific N.W. ports—Australia;
Chas. F. Crocker, American bark, 763 tons, Grays Harbor—Peru;
Conway Castle, British bark, 1,591 tons, Portland—United Kingdom;
Mindora, American schooner, 642 tons, Grays Harbor—Valparaiso;
Samar, American schooner, 673 tons, Puget Sound—Valparaiso;
S. G. Wilder, American barkentine, 557 tons, Pacific N.W.—Suva;
Freida, German ship, 1,991 tons, Columbia River—Delagoa Bay;
Versailles, French bark, 1,939 tons, California—Cork; and
Olivebank, British bark, 2,647 tons, Puget Sound—Cork.

We list these ships in full to show that the long ocean lanes and the heavy bulk seasonal cargoes on the Pacific Coast were being largely served by wind powered ships as recently as 1911. In this connection, it is interesting to note that the November, 1911, issue carried a half-page advertisement that declared "Dahl Oil Burning System concludes all argument in favor of oil fuel."

Marine Section National Safety Council

At the Twenty-Fifth National Safety Congress, Atlantic City, New Jersey, October 9, the following men were elected officers and executive committee of the Marine Section of the National Safety Council, and charged with the promotion of safety on board the ships and on the seaport docks of America:

General Chairman—Captain E. C. Holden, Jr., United States P. & I. Agency, Inc., New York, N.Y.

Vice-Chairman (in charge of posters and slides)—Robert F. Hand, Standard Oil Co. of N. J., Marine Dept., New York, N.Y.

Vice-Chairman (in charge of publicity) — W. E. Stewardson, Colombian Steamship Co., New York, N.Y.

Vice-Chairman (for the Pacific Coast)—Albert O. Pegg, Union Oil Company of Calif., Los Angeles, Calif.

Secretary—Carl F. Vander Clute, admiralty attorney, New York, N.Y.

News Letter Editor — Henry Blackstone, United States P. & I. Agency, Inc., 340 Pine St., San Francisco, Calif.

Engineering Committee Chairman—B. C. Edwards, Atlantic Gulf and West Indies Steamship Co., New York, N.Y.

Membership Committee Chairman—E. W. Fiske, Jr., Socony-Vacuum Oil Co., Inc., New York, N.Y.

Program Committee Chairman—Byron O. Pickard, Pacific Coast Marine Associations, San Francisco, Calif.

Statistics Committee Chairman—Benjamin H. Self, Travelers Insurance Co., New York, N.Y.

Stevedoring Committee Chairman—F. C. Gregory, Waterfront Employers Association, San Francisco, Calif.

● *Members at Large*

Frank E. Ames, Lykes Bros.-Ripley Steamship Co., New Orleans, La.

W. P. Biggs, Navy Department Safety Engineer, Washington, D.C.

C. F. Blackton, Erie Railroad Co., Jersey City, N.J.

Frank H. Cogan, The Delaware, Lackawanna and Western Railroad Co., New York, N.Y.

J. M. Griser, Alabama Dry Dock and Shipbuilding Co., Mobile, Ala.

Henry J. Heidorn, Standard Oil Co. of N. J., Marine Department, New York, N.Y.

John S. Hunter, The Atlantic Refining Co., Philadelphia, Pa.

Willard F. Jones, Gulf Oil Corp., New York, N.Y.

T. F. Kavanagh, Grace Line, Inc., New York, N.Y.

Frank C. Laurie, Lago Petroleum Corp., Maracaibo, Venezuela.

Stewart Lee, Jr., New York Shipbuilding Corp., Camden, N. J.

J. L. Luckenbach, American Bureau of Shipping, New York, N.Y.

John McGrath, Atlantic Coast Stevedoring Co., New York, N.Y.

Carl E. Petersen, Newport News Shipbuilding & Drydock Co., Newport News, Va.

H. W. Proom, 1 Broadway, New York, N.Y.

J. K. Robison, Sinclair Navigation Co., New York, N.Y.

J. A. Rumsey, Standard Oil Co. of Calif., Richmond, Calif.

S. A. Schramm, Black Diamond Steamship Co., Pier K, Weehawken, N. J.

H. L. Seward, Yale University, New Haven, Conn.

A. J. Smith, Marine Office of America, New York, N.Y.

Arthur M. Tode, consulting marine engineer, New York, N.Y.

G. E. Taylor, Federal Barge Lines, New Orleans, La.

J. H. Tomb, New York State Merchant Marine Academy, New York, N.Y.

Elliott Vandevanter, Office of the Chief of Engineers, Munitions Bldg., Washington, D.C.

L. H. Westdahl, Dollar Steamship Lines, San Francisco, Calif.

A. O. Woll, General Petroleum Corp. of Calif., Terminal Island, Calif.

John Wright, American Export Lines, New York, N.Y.

The Problem of Differential Subsidies

By Jesse E. Sangstad*

The American merchant marine is today confronted with the application of a new subsidy law. This law seeks to replace a subsidy policy of fixation by a policy of almost complete flexibility on a cost differential basis. Moreover, the new law establishes a new agency authorized to determine and carry out the intent of the law upon its own responsibility or in cooperation with other agencies of the Government. This leads directly to two major questions: What are some of the practical difficulties in the cost differential device as a yardstick for the measurement of subsidies in international shipping? What are some of the most important conditions in international shipping which officials of the new shipping agency face in the administration of the new law?

Entirely aside from the more obvious requirements of replacement of tonnage and the maintenance of ocean services, the Commission faces the fundamental technical difficulty of how to determine the cost of construction in foreign countries, as provided in Section 502 of the law, in order to establish a base for a cost differential between the **price** of a ship in the United States and the **cost** of building a ship in a foreign market.

● Construction Differential

Attempts to establish a cost differential to show the competitive status of industries in different countries have been made for many years and, with variations, the theory was applied to shipbuilding for a long time. As to the practicability of this method, we may rely on the record.

It will serve no useful purpose to suggest even a partial list of the complications involved in dealing with anything so elusive as a cost differential applicable to the cost of building or operating a ship in a foreign country. Aside from the inherent difficulties involved at all times in the ascertainment of costs of production, the policy becomes even more difficult during abnormal periods such as have prevailed during recent years. For example, fluctuation in foreign exchange can quickly upset the whole scheme of cost-equalizing differentials.

It is to be hoped that the Commission will not overlook the experience and the opinion of the government agency which has had the most extensive contact with a similar problem. Authoritative statements are available to show that the United States Tariff Commission has found itself as constantly advancing toward a realization of the futility of relying upon differences in costs of production as a primary criterion for the establishment of differentials as between American and foreign products. It will be found that competent authorities in the Government today have expressed the belief that the economic basis of cost of production is thoroughly unsound even if applied to a product in a restricted market such as is the case in the shipbuilding industry.

The responsibility of determining what a cost differential shall be as between the United States and other customs jurisdictions of the world with which we have to deal is one that will demand all the resources of both cost accountancy and naval architecture.

French Experience. Sixty years ago the French Government, in considering the position of its shipping and shipbuilding industries, began its first approach to this question. In 1876, the French Parliament considered a proposal for a subsidy law based upon the difference in cost of construction in French and foreign shipyards. It required five years and a Parliamentary merchant marine bloc of more than 250 Senators and Deputies to find a way out of the differences of opinion which this policy raised.

Not until 1881 did France adopt a construction bounty system based on cost differentials. In that country the system has passed into history. Under it the first bounty was paid in 1881 and the last in 1920, a period of 40 years, during which a sum of about 245 million francs, or 46 to 47 million dollars, was expended on the system. Since then, France has conducted its ship construction subsidy policies on the basis of a fixed 15 per cent differential and a contribution of interest plus easy credit facilities.

French System Abandoned. Now why was this system abandoned in France? In the first place, the cost differential subsidy was not paid to the French shipyards but to the owner in the form of an operation subsidy calculated to equalize the extra cost he paid for a ship built in a French shipyard. Since the first law was limited to a 10-year period, French shipowners rushed into the market for tonnage in order that they might have as much time as possible to recover the extra cost through operation of that tonnage. The net result was that shipbuilding prices soared out of all proportion to the navigation subsidies which were supposed to equalize those prices. The French Government extended and amended the law in various forms until 1906. Meantime, the operation of the system up to 1906 had the result that French owners paid more than world market prices for French-built vessels; that the government compensated them for the difference through an operating subsidy; and that the extra cost of financing the differential had to be carried by the French owner. So, in 1906, shipbuilders were invited to state under what conditions they would build vessels to be quoted at equal prices with foreign vessels. An investigation of shipbuilding costs as between France and the United Kingdom revealed that French shipbuilders estimated the difference between French and British costs to be about $32 per ton, the directors of French customs estimated it to be about $25 a ton, and that the cost differential was finally fixed at about $33 a ton.

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*Abstract of an address before the American Merchant Marine Conference at Boston, Mass., on September 29, 1936. Mr. Sangstad is connected with the Department of State.

As previously stated, since 1920 the French Government has fixed an arbitrary differential of 15 per cent as a protective device to French shipbuilding. Under the system, of a total of 243,654 tons acquired by French shipowners from 1928 to 1933 under guarantee of interest contribution by the French Government, 93,487 tons, or 39 per cent, were built or purchased in foreign countries.

There is, of course, this difference between the 40-year French experience with the cost differential system and our new law, that under our law the determined differential is to be paid directly to the shipyard, thus relieving the shipowner of the financial responsibility of diverting capital for financing the differential.

The Commission faces the historic fact that all programs laid down for construction of a considerable number of ships have automatically and in all countries been accompanied by a progressive increase in the price of such ships.

Japanese Experience. As an outstanding example of increase in the price of tonnage during the period of a construction program may be cited the construction of 200,000 tons of fast freighters in Japan during the period from October, 1932, to March, 1935. Despite the close control of industrial activities in Japan and the fact that the steel industry is practically a government monopoly, tonnage prices on the large-type, high-speed, motor-driven freighters being built in Japan rose from a range of 130 to 170 yen per ton at the beginning of the program in 1932 to a range of 250 to more than 300 yen a ton for tonnage laid down during the last year of the program. On ordinary steam-driven tonnage of large size, the price ranged from 80 to 120 yen in 1932 and reached a range of 130 to 180 yen in 1935, according to the Marine Book of Japan for 1935.

If this be so, it raises the question—can any device be established to exercise control over increased prices? The answer is—No. Control of tonnage prices would mean control of all the elements which enter into the building of a ship and control of all the industries which contribute to the building of a ship, an obvious impossibility.

Price versus Cost. Shipyards may control the **price** of ships to an extent determined by competitive conditions within the shipbuilding industry, but they do not control the **cost** of building a ship, except perhaps to the extent that they can control the margin covering overhead and profit.

Many of us recall an event which took place in 1925, when one of the most prominent British liner companies placed an order in Germany for five large motor ships, and the subsequent alarm in British shipbuilding circles because this order went to a foreign country. We remember how the Shipbuilding Employers Association addressed an invitation to nine trade unions having to do with shipbuilding to enter into a joint inquiry on fundamental conditions in the industry. They sought and received the cooperation of government departments on questions relating to the general position of foreign competition and to statutory enactments regarding hours of employment in certain foreign countries. After exhaustive investigation of the various factors entering into the construction of a ship, classified under 10 headings, the joint inquiry found the following cost factors to be outside the control of the industry; namely, materials and equipment, interest rates and taxes, social services, cost of living, and public services, including pilotage, towage, harbor dues, and so forth. The Committee found that the one item within the control of the industry was that of general overhead and profit.

While the cost factors involved have no particular significance at this time, the Committee found that the German price accepted was 153,000 pounds, whereas the lowest British tender, without any allowance whatever for taxes, overhead and profits, was 213,000 pounds, a difference of 28 per cent.

● Extension of Public Credit

Another condition of interest is that no government in any maritime nation extends public credit or public funds in aid of ship-

One of the most graceful ships on the Pacific Ocean lanes is Matson's beautiful passenger liner Lurline.

building in excess of 60 per cent of the value of such tonnage against security of the ship alone. The French Government may underwrite 75 per cent of the value of the ship only against a bank guarantee, and a government guarantee on 85 per cent of the value of a vessel may be obtained only against additional collateral. In effect, the provisions of Section 502 of the Merchant Marine Act 1936 actually provide a 100 per cent credit so far as the shipbuilder is concerned, since the United States Government undertakes the whole contract.

On the other hand, the required 25 per cent down payment on the American price of a vessel will be proportionately high if the cost differential is determined to be as high as 40 to 50 per cent. Normally purchasers of tonnage in foreign countries are required to finance at least 40 per cent of the value of the ship. The required 25 per cent down payment on the American price will equal the 40 per cent down payment in foreign countries when the cost differential reaches about 38 per cent.

● Operating Differential

Turning now to the cost differential policy as applied to ship operation under this law, we find it has the characteristic of being based upon performance and not upon promise. Rather than contract for service, at a fixed amount subject to penalties for non-performance, it is intended to settle the accounts periodically through findings by the Commission.

While this gives complete flexibility, subject only to the discretion of the Commission, it also carried an implication in the direction of less responsibility on the part of the operator. In at least one well-publicized instance, in which a heavily subsidized line of foreign nationality was concerned, operating under a contract guaranteeing the contracting operator against loss through an annual accounting, the public cost was increased fourfold in 10 years. It was found, among other things, that the subsidized operator ran a private commercial service parallel to its subsidized service and that most of the high-class freight went to the commercial line, while losses to the subsidized line increased annually and were made good by the Government. The government concerned during the last few months has discontinued at least part of that subsidized service.

● Labor Legislation

Finally, may I point to one more factor in connection with the operation of subsidized shipping, a factor which many of us believe is part of a world-wide movement, a factor which is becoming recognized in the costs of operation of ships and which recently has become measurable in terms of public expenditures required to meet it. I refer to the increasing adoption by maritime nations of social legislation as applied to seagoing personnel. Personally, I believe that no problem in shipping at this time is more potent in its possibilities, or will require more intelligent management by those charged with the administration of national policy in regard to shipping. Systems of working conditions, wages, manning scales, social insurance, pensions and forms of compensation are in force in maritime countries, and in some countries they are part of the subsidy system.

Without discussing the discernible advancing front of this movement in international shipping, I may say that at the Preliminary Maritime Session of the International Labor Conference, held at Geneva in 1935, the question of an international convention on manning and the adoption of a 48-hour week was discussed largely on the basis of the French eight-hour law which has been in force for a number of years and which is consistently used by French statesmen in support of the subsidy system of that nation. Since last November, however, the French Government has adopted a 40-hour week and the proposed application of this, plus other concessions to seagoing personnel, has now been recognized by the French Parliament in terms of extra appropriation and extra subsidy. For the current year, the regular budget of the French Government covering merchant marine services carried roughly an amount of 475 million francs. During the past 60 days, an additional allowance of 110 million francs has been allotted by Parliament simply to meet the additional charges imposed upon French shipowners by the new 40-hour week, increase in pay, allowance for overtime, and vacation with pay. In other words, of a total annual appropriation now available to French shipping of nearly 600 million francs, or about 40 million dollars, more than 20 per cent is chargeable to social legislation.

A certain German shipping company of considerable importance includes social expenditures in its annual accounts for the years 1933, 1934, and 1935, amounting to 17 and 18 per cent of its so-called operations charges, not including fuel.

The period of depression has constricted the industry and has impeded the process of adjustment of its problems in the natural way of normal activity. Nationalism in maritime countries, seeking to maintain national merchant marines, has led to subsidies. Experience with subsidies has brought within the sphere of government influence a wide range of the problems with which the industry is concerned, including those which involve social legislation.

In approaching the problems which our new shipping law lays upon it, the Maritime Commission will be well advised to consider the lessons taught by the experience of other countries.

American-Hawaiian intercoastal cargo liner in the Panama Canal.

Safety at Sea

By Rear Admiral John G. Tawresey, (CC), U.S.N. (Retired)*

The sea is the highway of nations. There the vessels of all countries are exposed alike to the same dangers, and there the opportunity to render aid and to effect rescues comes to all alike. Safety cannot depend on national regulation alone. It is an international matter, and for the greater success requires international cooperation. Acceptance of that truth opened the door for holding the International Conference on Safety of Life at Sea, 1913-1914, and prepared the way for the Safety Convention adopted by the international conference of 1929. That great document marks the beginning of effective international cooperation to reduce marine losses. Safety at sea still needs pathfinders to pioneer beyond the minimum permissible standards of the present Convention; it needs volunteers to provide the stepping-stones that lead to further advances in safety.

Many subjects remain to be studied, much data must be collected and analyzed, many devices remain to be tried out and many safety measures to be tested practically, to determine the gain in safety in relation to their economic practicability. These are matters that should engage the attention of naval architects, ship-builders, shipowners, and administrative authorities, if the next conference on safety at sea is to have the additional and necessary definite information, such as was available for the 1929 conference. That is the sure road to further gains in safety, gains that are practical and beneficial to all concerned. It is time to sound a call for further pioneering in the domain of safety at sea.

In what follows, a few of the subjects requiring consideration are stated and discussed briefly.

● Degree of Subdivision Designation

Such terms as one-compartment and two-compartment are not used in the Safety Convention and are not defined therein.The factor of subdivision is the Convention measure of a ship's subdivision. Nevertheless these terms are used, both in technical articles and in popular descriptions, to designate the degree of subdivision. Such terms have a popular appeal, which indicates their continued use and hence the need for authoritative definitions.

The margin line is placed three inches below the bulkhead deck at the side to allow for minor variations and for some degree of approximation in performing the calculations. That is not intended to provide a margin of safety. The margin of safety is allowed for in the permissible factor of subdivision.

The assumption that a two-compartment ship is one that is safe with any two adjacent compartments open to the sea is inevitable. Some reserve buoyancy is necessary to make the assumption true. I therefore propose, in order to make the terms acceptable and useful, that a one-compartment ship have a factor of subdivision of 0.90; a two-compartment ship, a factor of 0.45; and a three-compartment ship, a factor of 0.30.

When using such terms it must be understood that every reduction in the subdivision factor adds to the safety that depends on subdivision. If a ship cannot be made a two-compartment one, it is wrong to assume that there is no gain in safety by having subdivision in excess of the one-compartment standard.

● Greater Subdivision as a Benefit

It is true that a ship cannot be made one hundred per cent safe, and it is also true that the loss of passengers at sea in proportion to the number of miles traveled is very small. That is cause for satisfaction so far as it is the result of safety measures that have been adopted. But it is not an argument against further efforts to reduce actual annual losses. In so far as the very small losses are the result of chance, and not related to preventive measures, they but forecast approaching losses that will maintain the averages.

Unfortunately most of the published figures do not relate the losses to the exposure. They do not give the number of lives lost from vessels that were in collision in proportion to the number of persons on board such vessels; and, further, the number of lives lost from vessels that foundered following collision in proportion to the number of persons on board such vessels. Statistics that include every mile traveled, at sea, in harbors, and on inland waters, as making up the exposure figure, notwithstanding that a very large proportion of such travel is with no real danger at all, are of very little aid in judging the efficiency of safety provisions. The picture is obscured and the facts are made difficult to determine.

It is practicable for many more ships to have subdivision that will prevent foundering due to any usual collision damage. The safety of a one-compartment ship against foundering is limited. The factor of subdivision shows that vessel unsafe when a bulkhead is included in the damage. And that is a matter of chance. It is not possible to control the location of the damage, on or off a bulkhead, when ships come into collision.

It is therefore important to study all means for increasing floodable lengths, and at the same time to study the lengths of holds that are necessary for particular services. It is believed that all ocean-going passenger vessels can be, and should be, at least two-compartment ships, with a factor of subdivision not greater than 0.45. Further, cargo vessels from moderate lengths up should be not less than two-compartment ships.

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*Abstract of paper presented at international meeting of The Society of Naval Architects and Marine Engineers, New York, September 15, 1936.

The designer, owner, and builder who will prove in practice that, with the exception of trades requiring special vessels, ships can be built with one moderately long hold, and with other compartments of such length that the ship will conform to the two-compartment standard, will be public benefactors. They will show that it is not necessary to leave the safety of the vessel and those on board to the chance of collision impact occurring at a bulkhead, or away from a bulkhead. They will secure for themselves in such vessels the benefits of reduced hazard, and they will be providing proved practical experience for the benefit of the next international conference on safety at sea.

● Existing Ships

National regulation of shipping has included relaxation in favor of the existing ship. The Safety Convention follows the same principle. Provision was included for improving the safety arrangements on existing ships that do not comply with the requirements for new passenger ships "where practicable and reasonable."

The effectiveness of every provision of the Safety Convention depends upon the good faith of the contracting governments, and upon the diligence of their enforcing authorities. That is especially true in relation to existing vessels. It is not reasonable to require extensive alterations to a good serviceable ship in an attempt to make her safety equal to that required for a new vessel, and, equally, it is not reasonable to continue in service at greater hazard a vessel notably below standard, just because she is a vessel in service at the time the Convention went into effect.

Much can be done within reason on most of these vessels to improve their safety. Subdivision can be increased without re-bulkheading, openings in bulkheads and sides can be eliminated or reduced in number. They can be located higher in the vessel and the closing arrangements can be improved. Better provision can be made to concentrate pumping on compartments next to ones open to the sea. The fire hazard can be reduced and escapes and exits bettered. Lifeboats and their handling arrangements can be improved. Portable articles and equipment not built into the ship can be installed as required for new vessels.

The Convention chapter on radiotelegraphy, and the chapter on navigation, do not grant exemption nor relaxation in favor of "existing ships."

Measures can be taken, as indicated, that will to some extent compensate for deficiency in the subdivision of an existing ship when it cannot be made up. Some further compensation can be made for small vessels, or for vessels with numerically small complements of passengers and crew, by locating the berthing and living spaces near the lifeboats, on the same deck and immediately below, with no passenger space below the bulkhead deck.

If the foregoing measures will not give reasonable compensation for deficiency in subdivision that cannot be made up, then the number of persons allowed on board should be reduced until the hazard and the chance of loss of life by foundering is not greater than with the subdivision of a new ship. It is not reasonable to continue in service a vessel involving undue hazard that cannot be compensated for. Unsatisfactory conditions in other fields, such as fire regulations and health regulations, are not continued because of investment. The purpose of the Convention is to promote safety, and not to conserve parity in carrying capacity to a less safe vessel. Reasonable limitation of the number allowed on board is necessary in such cases.

True, a great deal of experience, comparison of vessels, and moderation will be required to evaluate satisfactorily the equivalent degrees of safety, and to apply the principles to existing ships. The subject is no more difficult than was the establishing of freeboard rules. They too are based on experience, comparison of vessels, and reasonable application. In that way freeboard tables have been developed to the great advantage of safety and to the general satisfaction of owners, builders, and administrative authorities acting for the public.

I therefore propose similar investigation and studies to improve safety and to make reasonable application of the principles of the Safety Convention, first to existing passenger vessels, and, next, to all vessels.

● Safety Ratings and Certificates

The 1914 Convention referred to minimum standards of subdivision

(Page 409, Please)

Modern provisions for safety at sea have multiplied greatly since the sailing ship days but the personal equation is still unsolved.

. . . Pacific Coast

Port Development and Construction

As Reported by the Port Development Committee of the American Association of Port Authorities

From September 29 to October 2, 1936, the American Association of Port Authorities held its 25th (Silver Jubilee) annual convention at San Francisco. One of the most interesting and important documents produced for that occasion was the report of the Committee on Port Development and Construction, covering activities reported during the last fiscal year. The following extracts from that report will be of interest:

Most of the harbor construction work has consisted of small extensions to existing facilities, although a few of our larger ports have made more extensive improvements.

On account of the increase in commerce and the over-crowding of terminal facilities in our ports, it will become absolutely necessary that some of these projects go forward in the future, and there is no doubt that some means will be found for financing them.

Reported Pacific Coast activities include:

Humboldt Jetties

A successful experiment in substituting precast concrete blocks and coping for large rock has been underway for several years in rehabilitating two large rockfill jetties at Humboldt Harbor. The decision to use concrete for exposed parts of the structure was reached when it was found that the cost of 20 ton stone, the minimum size that would remain in place, became prohibitive.

In these reconstruction operations about 34,000 tons of concrete were placed at a cost of $6.50 per ton. In making up these concrete blocks no reinforcement was used, and the best mixture proved to be 1:2:4.

Stockton, California

Prior to 1935 the facilities consisted of an open dock and two covered docks, a cotton compress and a grain terminal, and three brick warehouses. Last year we added four transit sheds, a grain terminal warehouse, having a storage capacity of 35,000 tons of barley and 1800 tons of bulk storage, a large unit was added to the cotton compress, several gear sheds were built, and nine warehouses were added to the three already built. A bean cleaning plant was installed, storage shed, machine shop and scale. The transit sheds are all linked together with a pneumatic tube system, connecting the dock offices to the main office, performing 20,000 miles of messenger service during the year. All facilities are served by a belt line railway which has been enlarged during the past year. During 1935, 9,149 cars were handled over this belt line railway. Approximately 32,700 trucks loaded and unloaded in the port area in 1935. The cotton compress handled 59,064 bales of gin cotton last year, which was received from San Joaquin Valley points.

Tacoma, Washington

George W. Osgood, manager and chief engineer, in the following statement sums up the maintenance and construction program during the past year for the Port of Tacoma:

We rebuilt our pier No. 1, open storage dock, which was originally constructed of creosote and untreated Douglas fir lumber, after its having been in use for fifteen years. We replaced all of the timber work above the piling and replaced 12 per cent of the creosoted piles. The timber, including caps and stringers, was in good condition, except at the bearing and contact points, at which points they had deteriorated sufficiently to require replacement. There is nothing out of the ordinary in this work other than to show the life of untreated fir timber in an open dock

The fishing boat wharf of the Port of Tacoma, Tacoma, Washington, will accommodate many large fishing vessels.

A busy day at Oakland's Outer Harbor Pier, with four ships on berth.

structure, as well as the percentage of replacement of the creosoted piles.

We also constructed a new warehouse on our pier No. 2, 300 x 113 feet, for the assembling of loose plywood, where it is graded and bundled for foreign export, all of the mills in this particular territory sending in their plywood to this plant. The building is of timber construction 300 x 113 feet, with a clear span, also, a depressed track in the center for 200 feet of the building's length. We used for the timber trusses 4 inch Teco split rings, their use materially lightening the trusses both with respect to timber and iron. The cost of the building was approximately $30,000.

Oakland, California

A. H. Abel, port manager and chief engineer of the Port of Oakland, gives the following complete statement concerning this port:

General improvement of facilities throughout the length and breadth of its 22 miles of waterfront marked the fiscal year 1935-36 for the Port of Oakland. These improvements were carried on by the Board of Port Commissioners, operators of the Oakland municipal terminals, and by the operators of privately owned waterfront facilities.

Oakland's western waterfront was particularly active, improvements having been made there by the municipality and private operators. In carrying out the improvements of the municipally owned and operated facilities, the Board of Port Commissioners was greatly aided by the Public Works Administration and the Works Progress Administration.

The beginning of the fiscal year found a P.W.A. project under way at the Outer Harbor terminal, where the apron wharf was being extended 301 linear feet. Before this project could be brought to completion, however, tonnage increases made it plain that more berthing space and more cargo handling space were needed, and two more P.W.A. projects were approved, one to add an additional 504 linear feet to the apron wharf, and the other to extend Transit Shed No. 2, 270 feet, increasing its capacity by 50,000 square feet. These projects will be completed before the end of the present year and will give the Outer Harbor terminal a total berthing space of 5989 linear feet, and transit shed area of 396,030 square feet. Those figures include the Fourteenth Street, Wharf Street, and Seventh Street units, and the Outer Harbor terminal oil pier.

The Port Commission also completed the installation at the Outer Harbor terminal of a 40-ton motor truck scale, with a 60-foot platform which is adequate to accommodate a truck and trailer in one weighing operation.

Extensive improvements are now getting under way in the Brooklyn Basin area, at the Ninth Avenue terminal, and will be completed before the end of the year. The Board of Port Commissioners purchased twenty acres of land adjacent to the present terminal, and through a grant from the Public Works Administration the apron wharf is being extended 506 linear feet and the entire area is being brought to grade to permit the handling and storage of lumber and other cargo. This will give the Ninth Avenue terminal a total berthing space of 2050 linear feet, transit shed area of 91,000 square feet, and open wharf area of 227,660 square feet, exclusive of the graded area adjacent to the wharf proper. The port purchased a lumber carrier to speed up the handling of lumber at this facility.

The Albers Bros. Milling Co. is altering and expanding its present plant to care for the groat mill and rolled oat mill which were removed from Portland, Oregon.

The Western Vegetable Oils Co. began operation of a new oil mill, manufacturing oils from Oriental seeds and nuts imported through the facilities of the Port of Oakland.

The General Petroleum Corporation improved its Outer Harbor terminal plant by constructing an oil storage warehouse, a barrel conditioning shelter, and a two-story addition to its office building.

The El Dorado Oil Co. erected a new copra mill building at its plant at the foot of Adeline Street.

The Howard Terminal began the reconstruction of the apron wharf and the building of a new warehouse on the east side of its pier No. 2.

The Taylor Milling Co. purchased a grain elevator at the foot of East Seventh Street in the Inner Harbor, which it will operate as a feed mill. A two-story brick addition was built alongside of the existing elevator for the use of the company.

Probably the most colorful addition to the waterfront during the year was the fishermen's pier, which was established at the foot of Franklin Street by the Marine Trading Company. The Franklin Street pier was rebuilt to the needs of this new facility, where both wholesale and retail trade is carried on. The fishermen's pier met with instant success and is proving to be one of the most popular points on the Oakland waterfront.

All in all, the year 1935-1936 has been exceptionally active, and the indications are that the forthcoming twelve months will witness the continuance of expansion and improvements on the Oakland waterfront.

Olympia, Washington

Ernest C. Gribble, general manager, presents a brief outline of new construction and reconstruction items in the Port of Olympia:

1. Addition to Transit Shed "B" 60 x 312 feet in size. With this addition, the area of Transit Shed "B" is now 60 x 700 feet.
2. The transfer of Port of Olympia railroad yard tracks from their former position in the rear of Transit Shed "B" to a point sufficiently westward therefrom to allow the construction of 80 feet of additional width to Transit Shed "B." This yard track now has a capacity of 100 railroad cars.
3. Reconstruction of 700 feet of wharf at berths one and two, including the renewal of all timbers under the shipside tracks.
4. Construction of loading dolphins at berth No. 5 for the mooring of vessels loading overside from rafts and barges.

San Francisco, California

Frank G. White, president of the association and chief engineer of this important Pacific Coast port, recites the construction and reconstruction program of the port:

In order to provide more adequate office facilities and additional cargo area, as well as a connection between piers 38 and 40, for the use of the McCormick Steamship Company, a new bulkhead building was constructed across the ends of the two piers and the intervening slip.

The building is a steel frame structure with metal lath and plaster walls, steel sash and steel rolling doors at the main pier and railroad entrances. It is 40 feet wide, 455 feet long, and two stories high. The entire second floor is occupied by offices, ships' stores and cargo. The work was completed and accepted on August 19, 1935.

The excessive cost of maintenance, the increasing fire hazard, and the unstable condition of the foundation of the bulkhead building at pier 46, indicated the advisability of replacing the old timber wharf at this location with a reinforced concrete structure. The project includes the removal and reconstruction of the wharf from the north side of pier 44 to the south side of pier 46, the underpinning of the headhouse at pier 46 and the construction of new foundations and a concrete deck, rock filling to stabilize the seawall, the driving of replacement piles under pier 46, the reconstruction of the Belt Railroad tracks in the vicinity, and the paving of the wharf and a portion of the Embarcadero.

Docks and storage for Petroleum Products at Portland, Oregon.

The wharf which is under construction is 600 feet in length and 60 feet in width. The supporting members consist of timber piles protected by precast, reinforced concrete jackets. Along the section where additional fill is required a retaining wall constructed of precast and cast-in-place reinforced concrete slabs is provided, and the wharf deck is constructed as a relieving platform over the fill, for a distance of 14 feet back of the wall.

With the completion of this structure, the reinforced concrete wharf and bulkhead will extend continuously from Powell Street to Third Street, a distance of approximately three miles. The work, which is being partially financed by a P. W. A. grant, was 47 per cent completed on June 30, 1936.

In 1928 a bulkhead wharf and wharf shed were constructed, connecting piers 26 and 28, for the use of the American-Hawaiian Steamship Company in the handling of package freight. This facility has functioned so satisfactorily that a similar structure is now being constructed between piers 24 and 26.

Cold and ventilated storage, Port of Portland.

The length of the wharf between the piers varies from 185 feet at the waterfront line to 200 feet at the outer edge, and it extends into the slip a distance of 141 feet. The timber deck, which is elevated truck height above the street to facilitate cargo handling, is supported on timber piles protected by pre-cast reinforced concrete jackets. Two ramps located adjacent to the outer wall of the building permit access to the elevated deck by tractor and trailer trains from piers 24 and 26. The wharf shed is a timber frame structure and is equipped with continuous steel rolling doors along the street front. This project, which is also being partially financed by a P. W. A. grant, was 65 per cent completed on June 30, 1936.

Long Beach, California

The new port manager of Long Beach Harbor, D. A. Marshal, advises that since 1925, when the port was first opened to ships of deep draft, more than $8,000,000 has been expended on a total of 8,000 feet of frontage which is now available for berthing and accommodating twenty-five to thirty ships simultaneously.

During the past year, a new transit shed and a modern office building for the harbor administration staff have been added. These improvements comprise about 50,000 square feet of new covered space.

An additional transit shed 1,000 feet in length and 120 feet in width is proposed for the outer harbor pier next year, as well as additional marine improvements for the U. S. Navy, who are using this port more extensively each year for anchorage and shore activity.

Modern Atlantic Liners

By Ernest H. Rigg*
Naval Architect. New York Shipbuilding Corporation

FOREWORD

At the close of a very interesting review of the development and present status of passenger liner design as exemplified on the North Atlantic ferry lanes, the author made some very trenchant comments on the future, under the subheading "The Next Step."

Ernest H. Rigg is one of the ranking naval architects of the United States. To use his own words, "Consideration of the next step is undertaken with trepidation and respect." The respectful consideration of such a subject by such an authority is well worthy of study, and we present it here without further comment.

When the evidence is assembled, including consideration of present business conditions, it is felt that a recession in dimensions from something over 1000 feet in length to about 850 feet may well be carefully considered, still with a view to maintaining a four-day schedule satisfactorily.

At 36 knots the two designs require about the same power, namely, some 325,000 shaft horsepower; but at 33 knots the 850-foot ship will require about 200,000 shaft horsepower and the 1000-foot ship about 240,000 shaft horsepower, figures subject to refinement on development.

Recent model basin work indicates that we may now expect better propulsive coefficients with four-screw drive than only a few years ago.

On the face of it, the longer ship will carry some 30 per cent more passengers. Whether first - class bookings in recent years make this a strong point is doubtful; also, this percentage drops to about 16 unless an additional row of inside rooms is accepted on the larger ship; recent emphasis has been on the maximum number of outside rooms, so that the extra 12 feet of beam is rather a dubious asset, even with "Bibby" type rooms.

In any case, the power for the two lengths is about proportional to the number of normal outside room passengers that can be carried, which leaves direct operating costs and revenue about a stand-off, with the shorter ship definitely ahead on first cost and carrying charges.

When we consider further the probable behavior in North Atlantic service, we are at once confronted with a difficult problem and one capable of no simple solution. Our general knowledge, refreshed and given point by reference to a recent paper on this subject (Kent, Transactions of the Institution of Naval Architects, 1934), will convince one of the difficulties of estimating behavior at sea in advance of actual service experience.

However, this problem must be faced, and we have some guidance available. The natural pitching period of ships can be approximated in advance from previous experience. The period of encounter with the waves is a function of speed of ship and the sea-way running and is subject to control by changing speed or course, or both, if necessary. This means delay, but given real bad weather, that is inevitable in any case, so we are thrown back to the problem of designing for the greatest weather range below compulsory delay.

We start with several ships of good repute but at 10 knots less speed than that required for our four-day liner. We have two such type ships in naval service, both as to length and speed. Their behavior as sea boats is understood to be good, but exact information is not available to the writer; in any case, naval and merchant ship qualities are subject to different comparative bases.

We may well consider Kent's diagrams equating ship lengths, wave length, and behavior to be expected; i.e., for the two lengths under discussion.

Let us take a typical North Atlantic storm wave of 500 feet in length, giving ship (waterline) to wave length ratios of 2.00 and 1.70 for our longer and shorter ships respectively. The shorter ship (850 feet, waterline) looks better than the longer on this basis.

The ratios of probable ship pitching periods to periods of encounter (head sea) are about 2.085 and 1.875 respectively at 33 knots, both of which values are well clear of synchronism; i. e., unity ratio. For the average winter wave of 400 feet observed by Kent these ratios are still greater, namely, 2.44 and 2.2.

For following sea conditions, the faster ships will be better off than the slower, as, I believe, has been amply demonstrated by warship experience.

In the same general range of length, but of lower speeds, there are several ships of varying reputation as sea boats. Satisfying the above elements is only one step; after that come the lines of the ship and weight distribution, which is quite an involved study but very much assisted if experience is ample and docketed in such a way that it can be utilized and its teachings applied.

There is another point that may well be considered; namely, suitability of this length (850 feet) from the point of view of optimum wave making. The fact that two Admiralties have picked 850 feet for 32½-knot ships is very significant. Preliminary study might rest there, but let us go a little further. Taking a longitudinal coefficient of 0.57 and a speed of 33 knots, we get for our 1000 and 850-foot ships Froude (P) values of 1.01 and 1.10 respectively.

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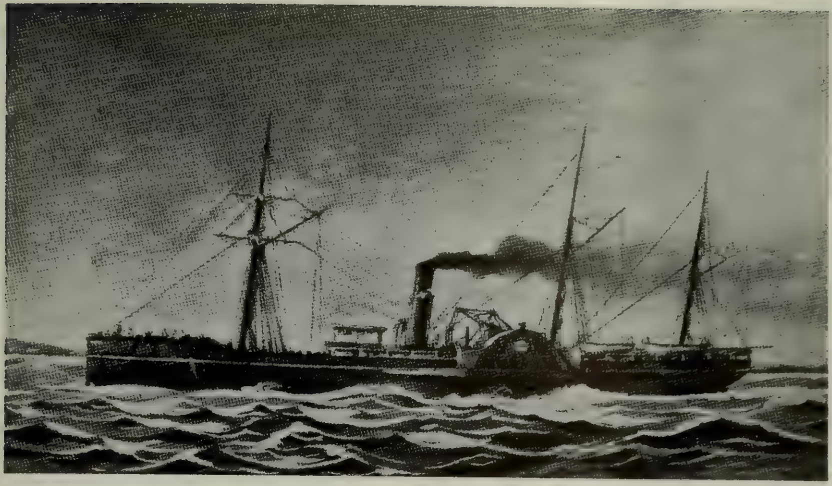
*Extract from a paper presented at international meeting of The Society of Naval Architects and Marine Engineers, New York, September 19, 1936.



A typical American ocean liner of 1870. Compare with the modern product below.

Reference to Baker's work indicates a preference for the 1.10 value, a point in favor of our 850-foot ship. (Waterline lengths are used for these values.) The Manhattan of the United States Lines has demonstrated good time-keeping ability as well as good sea-going characteristics. At $21\frac{1}{2}$ knots her (P) value is 0.756, a favorable one. Check values for Mauretania, Aquitania, Europa, Conte di Savoia, Normandie, Queen Mary, Hood, Saratoga, etc., are very desirable, but I hesitate to work them out, lacking accurate prismatic coefficients, etc.; estimates are dangerous.

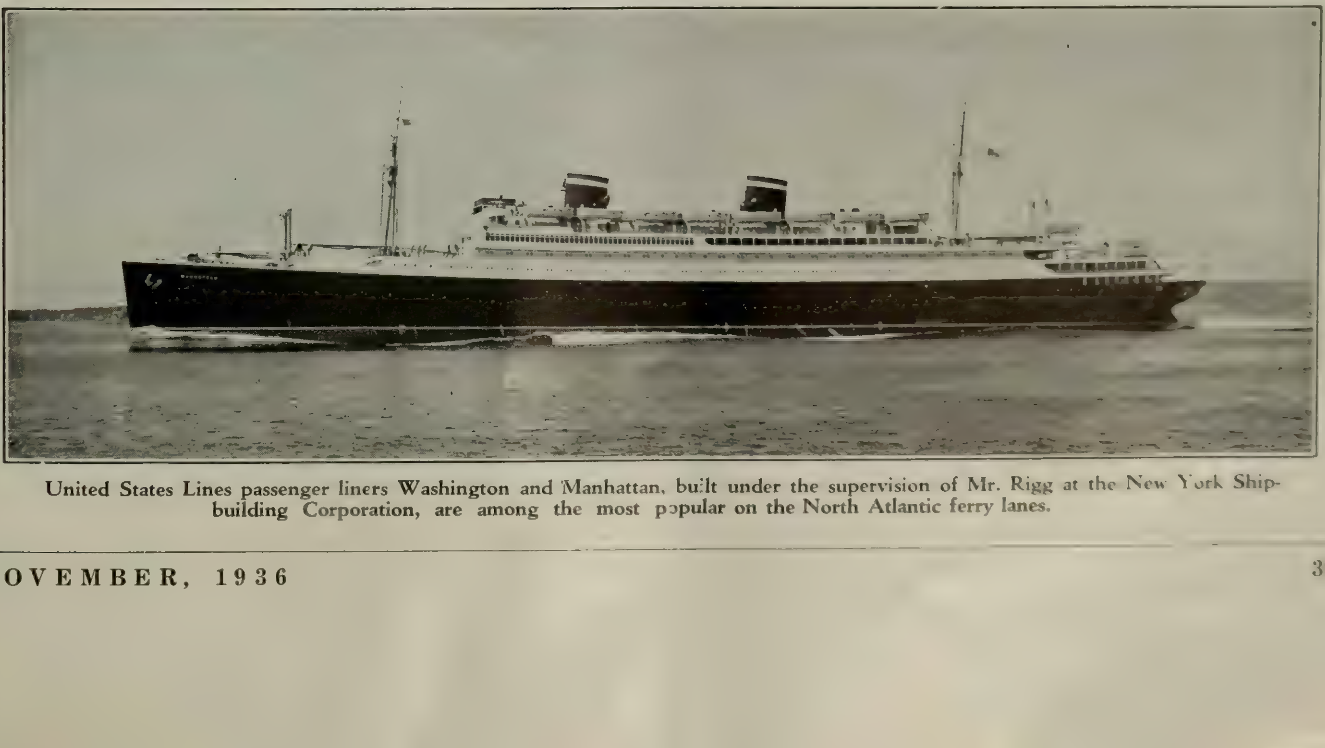
If it is felt that too much space has been given to these points, my answer is that they are of the essence in ships of the type we are discussing, whatever actual value may be placed on them in designs of sizes, speeds and types for which experience provides ample comparisons. I submit that a good case for the 850 footer has evolved from this analysis.

The modern Atlantic liner is a symbol of comfort and luxury. Channel steamers and warships are not so associated in our minds. Channel steamer passages average only a few hours, warships are not used for passengers at all except on emergent business; so that for these two types neither comfort nor luxury are demanded beyond reasonably attainable degrees; i. e., to the extent that they can be obtained without sacrificing more urgent attributes. Comfort will always be demanded on liners. These arguments point to four-day liners of somewhat less size and luxury, and possibly more comfort, certainly with more economy. Such a vessel checks better with present-day business conditions than the 1000-foot liners which we are now welcoming to the service, but which have both received government assistance in financing to an extent understood to be greater than the customary average of such assistance for high-speed mail and naval auxiliary considerations.

There remains to be considered the matter of absolute size. Sending a boy to do a man's work has been done before now, with ships as well as with other things; the citing of instances would do no good, besides being tactless. It is believed that no such charge can be justified against an 850-foot ship, even at 33 knots in reasonable weather. In considering such ships we may well place more emphasis on reasonable weather than has been done in the past. There has been too much tendency to insist on top speed anyhow. Our ship may well operate on a four-day (200,000 shaft horsepower) schedule for seven months, and on a $4\frac{1}{2}$-day schedule, 29 knots (125,000 shaft horsepower), for the five less favorable weather and slack travel months. Instead of a noon departure and noon arrival basis, a midnight departure and noon arrival basis should work out satisfactorily, with rail or city terminals at each end and no tender service necessary. Extremely bad weather will upset any schedule; that is always understood, whenever it may see fit to occur.

As soon as one record is set up, particularly where it is an international question that is involved, we begin to hear proposals as to the next step. Already we have heard of proposals looking towards something faster than the four-day ships which have now set up that record.

Undoubtedly it is a matter of national pride as to which ship holds the Blue Ribband; the champions



United States Lines passenger liners Washington and Manhattan, built under the supervision of Mr. Rigg at the New York Shipbuilding Corporation, are among the most popular on the North Atlantic ferry lanes.

that superseded Mauretania did not wear the crown for 21 years or so. Bremen and Rex have both heard about Normandie (the time of this writing it is too early to quote Queen Mary).

I may be accused of several things, some unpleasant, but an excursion into the realms of the future is at least interesting to some and those who do no like it may skip the remainder of this section of the paper.

Consideration of the next step should not stop with the advocacy of smaller four-day ships; in this study some thought may, with great diffidence, be given to the speed beyond that of a four-day schedule. Schedules by days call for top speeds of 33, 38 and 45 knots for 4, 3½ and 3 days respectively. It is of interest to estimate the necessary powers for these speeds, based on present methods of ship propulsion.

Tentative proposals have already been made along these lines and it is less than a decade ago that the now realized four-day schedule was ridiculed. As a starter, and there must be a starter, however much we may change our views as we progress, let us take attained channel steamer speed-length ratios of 1.2 and see where such similes lead us.

Table 1 herewith shows the parallel results.

Item	4 days	3½ days	3 days
Speed, knots	33	38	45
Length, feet	760	1,000	1,400
Mean displacement	35,000	64,000	125,000
Approximate shaft horsepower	200,000	450,000	1,000,000

TABLE I

Regarding such ships as enlarged channel steamers we see that to equal their performances we still have to take 12 hours off the four-day present record.

The old experience of saving a day by doubling the power gets a bad jolt; we double the power for half a day (12 hours) saved.

To attempt a three-day run on this basis is out of the question with available means of ship propulsion.

Cruisers already have four-day speed, so let us follow a similar course with cruiser practice as our guide. We then get Table II:

Item	3½ days	3 days
Speed, knots	38	45
Length, feet	800	1,100
Mean displacement	28,000	76,000
Approximate shaft hp...	315,000	1,000,000

TABLE II.

Again we land well beyond the present possibilities for a three-day liner as regards power. With battery, etc., weights turned over to accommodation, such ships would carry a fairly reasonable number of passengers, but not with all the amenities of existing modern liners; the accommodations would not be of the present order as regards space, either public or private.

Taking the fastest seagoing ships we have, namely, destroyers, as a base, we get Table III:

Item	3½ days	3 days
Speed, knots	38	45
Length, feet	500	700
Displacement	5,000	14,000
Shaft horsepower	112,000	360,000

TABLE III.

Destroyers already make the speed demanded for a 3½-day passage; this comparison is of value only as an indication. The questions of passenger numbers and reasonable comfort would render such ships entirely out of balance with all practice and experience.

The effect of type on power indicates the lines along which we would have to work, but the problems of realizing over 300,000 shaft horsepower for a 3000-mile journey on 14,000 tons displacement are somewhat awe inspiring.

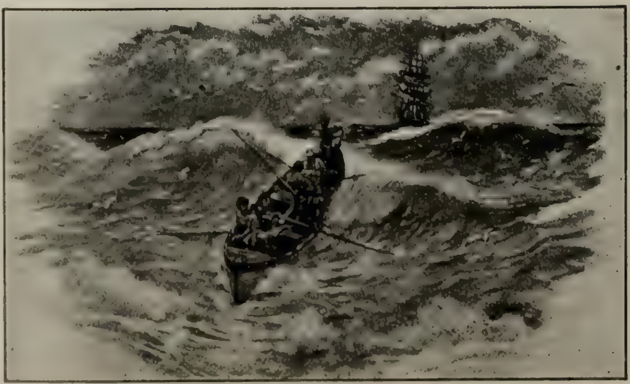
The efficiency of propulsion at these higher powers will also give us concern. At present we are touching ratios of effective horsepower (with appendages) to shaft horsepower of 80 per cent for single-screw drives; 70 per cent for twin-screw and 60 per cent for quadruple. I think it is fair to claim these figures for trial performances; they are in accordance with attained modern examples, but would have been too high only a few years ago. With 50,000 shaft horsepower per shaft as the so far attained maximum, we are faced with five and six-screw drives as a possible next step. The powers given above are on a 60 per cent basis, the realization of which is quite problematic.

Our Italian friends have experimented with ships (Rota, Transactions of the Institution of Naval Architects, 1909 and 1922, also Rotundi, Transactions of the Institution of Naval Architects, 1934) and torpedoes have long been driven by contra-turning screws on a common axis.

It has taken a clear generation to progress from five days to four days, but here allowance must be admitted for the war interruption.

There is still the question of the highest realizable surface speed without excessive damage and discomfort. It is by no means clear that a top speed of 45 knots would not be so often defeated by the sea that it would be found possible only for such a short percentage of the ship's time at sea that it would be foolish to aim for it. We do not yet know that 30 knots can be attained as a year round average. We do know that 26½ knots speed has been so established. The jump to a 40-knot average is a very long one, even for a very large ship. Warships have touched 40, but for how long and how often do they so travel? Our route is a bad handicap; it has the travel volume, perhaps, but not the desirable favorable weather conditions.

The attainment of the four-day schedule on more economic grounds looks more hopeful than any further advance in speed with present methods of propulsion.



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Marine Investigation Board Rules

On October 7 the Secretary of Commerce issued rules covering the conduct of investigations, by the newly created "A Marine Investigation Board," into "Marine casualties and accidents or acts of incompetence or misconduct by licensed officers or holders of certificates of service or efficiency in all cases involving loss of life." The following brief form of these rules will be found very convenient:

● **Rule I**

Sect. I. The Board's official title is "The A Marine Investigation Board."

Sect. 2. Defines official address as Department of Commerce, Washington, D.C.

Sect. 3. Permanent dockets and records shall be kept at Washington, open for public inspection.

● **Rule II. Definitions**

Sect. 1. Marine casualties involving loss of life shall include:

(a) Those involving any vessel in waters within the territorial jurisdiction of the United States;

(b) Those involving any American owned vessel anywhere.

Sect. 2. (a) "Party in Interest" as used shall mean "any person whom the Board shall find to have a direct interest in the investigation."

(b) "The Act" shall mean the Act of May 27, 1936, Public No. 622.

● **Rule III. Notice**

Sect. 1. On any marine casualty involving loss of life immediate radio or telegraphic notice must be sent direct to Bureau of Marine Inspection at nearest local office or at Washington. Such notice must include: names of vessel or vessels involved; names of owner or agent; nature and cause of casualty; the location; the nature of injuries to persons and damage to property. This notice is in addition to any other notice now required by law.

● **Rule IV. Voyage Records**

Sect. I. All voyage records (including rough and smooth deck and engine room logs; bell books; navigation charts and navigators' work books; compass deviation cards; stowage plans; records of draft; aids to mariners; radiograms sent and received; the radio log; and passenger and crew lists) must be retained by owners, charterers, agents and/or licensed officers and produced for inspection when required by the Board.

● **Rule V. Questionnaire**

Sect. I. Any person to whom the Board sends out a questionnaire shall within the specified time file with the Board the exact information requested.

● **Rule VI. Preliminaries**

Sect. 1. Investigation shall be promptly instituted by the Board.

Sect. 2. Board may designate qualified persons to conduct investigation. Board shall receive complete reports promptly, and be notified immediately of any serious misconduct on the part of any person.

● **Rule VII. Hearings**

Sect. 1. Board shall determine cause of and persons responsible for casualty.

Sect. 2. Any licensed officer is entitled to reasonable notice of hearing, opportunity of defense, copy of charge placed against him.

Sect. 3. Chairman of Board shall administer oaths.

Sect. 4. Any party in interest has right to appear, to call, examine and cross examine witnesses, to introduce documents or other evidence, at the hearings, in person or by counsel. Notice of appearances of counsel should be filed with Board prior to hearings.

Sect. 5. Whole record of testimony, findings, and recommendations shall be forwarded to the Director of the Bureau of Marine Inspection and Navigation.

Sect. 6. Director shall revoke or suspend license or certificate of service or efficiency on proof of holder's: misbehavior, negligence or lack of skill; endangering life; willful violation of any regulation provided for safety of life at sea; or incompetence.

Sect. 7. Provides for extension of time on hearings at discretion of Board.

● **Rule VIII. Witnesses-Records**

Sect. 1. Any member of Board may issue subpoena for witnesses, to be served by U. S. Marshal, local inspector, or person specially designated by Board.

Sect. 2. Subpoena for production of documents or other evidence may be issued only by the Board either on its own motion or on written application from parties in interest.

Sect. 3. Tampering with witnesses punishable by $5000.00 fine and/or one year imprisonment. Prosecution by Federal District Attorney.

● **Rule IX. Exhibits**

Sect. 1. Relevant or material matter in form of parts of books or documents may be read into record or a true copy in proper form received as an exhibit.

Sect. 2. Evidence exhibits should be placed in custody of the Board or its agents one day before hearing.

● **Rule X**

Gives the Director or the Secretary of Commerce discretionary power to make public any confidential matter or record.

● **Rule XI. Appeal**

Sect. 1. Appeal against order of the Director for revocation of license may be made to the Secretary of Commerce within 30 days of date of order. Decision of the Secretary must be based on testimony received by the Board and must recite findings of fact on which it is based.

Sect. 2. Appeals must be typewritten, brief, recite all necessary facts, state grounds of appeal separately, and be verified by appellant or his counsel.

● **Rule XII. Witness Fees**

Sect. 1. Witnesses to be paid for travel and attendance a fee not exceeding witness fees of United States District Courts and in same manner.

● **Rule XIII. Time**

Sect. 1. Describes method of computing time limits on orders or acts prescribed.

● **Rule XIV. Construction**

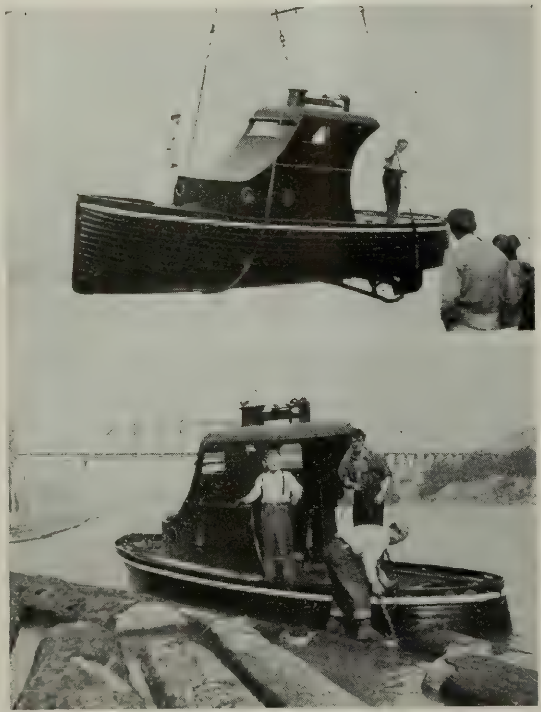
Sect. 1. Construction of Rules to be liberal.

Sect. 2. Rules have effect and force of Act on which they are based.

Sect. 3. Any rule may be amended or rescinded by publication in Federal Register.

A Mighty Midget

An Unusual All-Welded Steel Hull Diesel-Engined River Tow Boat



Two views of the all-welded steel midget tug Jeanne. Top: Being lifted into the river. Bottom: At work on log tows.

As an example of clever adaptation of modern design to a special problem, the new towboat, Jeanne, of the Cowlitz Towing Company, is unusually interesting. Captain Wagner, president and manager of the Cowlitz Towing Company, conceived the idea of a small tug for handling logs in the river and in the log ponds of the big mills. He discussed this idea with his son, an Annapolis graduate, and the result was the design of the Jeanne.

This craft has the following general characteristics:

Overall length	29 feet
Overall beam	7 feet 2 inches
Draft	30 inches
Engine	100 S.H.P.
Propeller speed	1500 R.P.M.
Propeller diameter	26 inches
Propeller pitch	12 inches

The entire hull and superstructure is of steel. A six inch T bar is used for the keel. Ribs of 1¼ inch T bar, appropriately formed, are welded to this keel on 12 inch centers. The tops of these ribs are welded to an angle bar which forms a continuous sheer strake around the deck edge. The deck beams are 1¼ inch T bars welded to the angle bar sheer strake. Deck and side plating is of 1/8 inch steel. The deck plates run thwartship and are one foot wide. These strips are cut to fit the beam of the boat at each frame and are welded to the deck beams and to the sheer strake with continuous weld. The side plates are six inches wide by 14 feet long. They are bent onto the ribs clinker fashion with a one-inch lap. The upper edge of each strake is welded to each rib at each edge of the rib. The strakes are continuously welded at each edge of the lap. This makes a very stiff and strong truss, since the welded laps are equivalent to longitudinal tensile members 1/4 inch to 3/8 inch thick by 1 inch wide and only 5 inches between centers.

A 3-inch iron pipe, cut in half lengthwise, is welded to the hull at the deck edge to serve as a bumper rail. The cab over the engine hatch is fabricated by welding from sheet steel and angle bars, and is bolted to the hatch coaming so that it can be easily removed for engine repairs.

A welded-in boiler plate engine foundation forms a structural member of the hull. The power plant is a Cummins diesel engine, Model H.M.R.-6, with a 4 7/8-inch bore and 6-inch stroke, developing 100 shaft horsepower at 1500 R.P.M. Cooling water for this engine is circulated in a closed system because much of this tug's work must be done in shallow water heavily charged with silt, sand, and other foreign matter. This system consists of a 20-gallon expansion tank in the engine room and three copper tubes 5/8 inch in diameter and 14 feet long laid on each side of the keel. This arrangement is very satisfactory in operation.

The hull was tested on completion by setting it up on two trestles set just short of the ends. In this position it was filled with water, but showed no perceptible buckle, warp, or leak.

The primary purpose of this tug was to supplement the work being done by the 175 ft. Pamona—a steam stern wheeler operated by the Cowlitz Towing Company. That it has been able to do numerous tasks formerly allotted to the larger boat is shown by the fact that it has operated about 500 hours since it was placed in service on July 30, 1936.

With fuel oil consumption averaging 2¾ gals. per hour, consumption of lubricating oil, 5 gals. every 75 hours, and with a crew of two men handling rafts up to 300,000 ft. from Ostrander to the mouth of the Cowlitz and working the ponds of the large mills, it has proved a very satisfactory investment.

The engine is equipped with electric starting and has never failed to respond to the first turn of the switch. The boat is remarkably free from vibration and rugged enough to stand up well under the severe use it receives in handling the rafts and working the ponds.

Trade Literature

Carbondale Absorption Refrigerating Machines — Readers interested in absorption refrigeration will find the 16-page booklet, designated as Bulletin 1104, recently issued by the Carbondale Machine Corporation, of particular value.

This booklet explains the absorption method of refrigerating and gives detailed information on the Carbondale units. The three types of absorption machines — Atmospheric, Double-Pipe, and Tubular—are illustrated by line drawings showing every detail of construction.

Photographs show various parts of the absorption system, including rectifiers, ammonia condensers, brine coolers, exchangers, absorbers, ammonia pumps, and compression machines.

This bulletin will be furnished upon request to Pacific Marine Review.

New Process of Hardening Metal Surfaces

Development of a revolutionary new process for the hardening of metal surfaces by means of electrical induction, which definitely will make tremendous economies possible in a wide diversity of industries, was recently announced by the Ohio Crankshaft Company of Cleveland.

In this treatment, known to the trade as the "Tocco Process," a high-frequency current at high voltage is transformed into low voltage with high amperage. In the case of crank shaft journal surfaces, this low voltage current passes into inductor blocks which surround but do not actually touch the bearing areas it is desired to harden. The inductor block current induces a current in the surface of the metal. This induced current is the heating factor.

When the area to be heated has been thus subjected to an accurately-controlled, high-frequency current for the correct length of time, the electrical circuit is opened and simultaneously the heated surface is quenched by a spray from a water jacket built into the inductor block.

When all the main, intermediate, and pin bearings are hardened, the entire shaft is drawn at a low temperature to remove strains. Then a final grind completes the shaft.

The combination of instantaneous pressure quenching and a split-second heating cycle produces a surface hardened zone blending gradually into the core with no sharp line of demarcation and consequently no opportunity for spalling. It was announced that this process of hardening crank shafts will be demonstrated at the 18th National Metal Congress and Exposition in Cleveland, October 19 to 23.

This process of selective surface-hardening by electrical induction has been found through years of experimental work — and latterly through actual production practice —to answer every requirement of the metallurgist and the engineer. Accurate control of the process permits the surface heating and quenching of practically all ferrous materials of cylindrical section, with the resulting hardened surface kept within close limits as to area and depth.

In adopting this process of surface hardening the manufacturers of engines not only in many cases effect a pronounced saving in the cost of manufacture by eliminating costly alloy steels and cutting down machining time, but also are assured of a superior hardened area — a longer-lived shaft. While these savings to the manufacturer are important, still more important savings are assured their customers. Operators of buses, trucks, and all heavy-duty machinery driven by engines with Tocco-hardened crank shafts are reporting important economies—less frequent and less costly overhauls, lower oil consumption, far longer periods of uninterrupted service. Recently passenger car manufacturers have adopted this process to obtain the same obvious benefits and advantages.

The process has already been adopted by such outstanding manufacturers as the International Harvester Company, the General Motors Corporation, Hercules Motors Corporation, the Packard Motor Car Company, the White Motor Company, and the Waukesha Motor Company.

The heat of steel to be used on a crank shaft which is to be Tocco-hardened must be one which passes the usual inspection tests, and in addition should be of the fine-grained type. After forging, the crank shaft is allowed to cool slowly, this alone producing the necessary normalizing. Then without further normalizing or heat treating, it is machined, radial oil holes drilled, and the journals rough-ground. The final grinding operation follows the surface hardening.

Something Different in Bulkhead Panels

A substitute for wood panels for use in houses, ship cabins, and the making of furniture, is now being introduced in France by the Isorel Company. This substitute may revive the popularity and use of wood paneling, according to the Paris office of the du Pont Company. It consists of a panel made of compressed wood fiber by a special process and dried slowly in hot air.

Natural wood paneling, in that country at least, has fallen off in usage because of the high price and the difficulty of obtaining sufficiently seasoned wood. These compressed wood fibre panels, when applied to walls, are said not to warp. If it is desired to obtain a natural wood effect, the panels can be veneered or the grain of any wood can be reproduced by means of the photographic and copper plate process. When this is done, the panels do not show knots or defects of any kind. They are then sprayed with clear cellulose varnish.

In order to obtain color effects, most of the panels now in use have received an application of either Duco or Dulux. When coated with asphalt or other suitable materials, they can be used for outdoor purposes and can be submitted to great exposure without warping or deterioration.

Owing to their insulating and sound-abating properties, these synthetic wood panels are said to be used extensively for rooms, office walls, and ship cabins, as well as in the manufacture of furniture.

Trade Literature

Catalog No. 365, American Chain Company, Inc., covers welded chain and attachments from the lighter sizes and types used for fabricating other manufactured articles to the heavier types used for maintenance service and material handling in industrial plants, oil fields, mines, shipyards, and on ships.

Catalog No. 366, American Chain Company, Inc., covers weldless chains and attachments. Weldless chains are those made from wire into various patterns by knotting to form the links, or by stamping from flat metal. Weldless chains are used for a host of purposes in the manufacture of many assembled articles.

Waterway Improvement Economics

By Major General E. M. Markham*

Chief of Engineers, War Department, U.S. Army

In the early days of our country communication routes were essential to the growth of outlying regions, and many transportation facilities were subsidized by the government for this purpose, with no thought of immediate return in dollars and cents. The need for this type of development has passed, and further transportation facilities should be provided, or existing facilities replaced, only after a showing of full economic justification. The economic value of a proposed transportation improvement is always difficult to determine, as the routes and methods that will be used by commerce, and the cargo that will move over these routes, must be estimated. With several competing forms of transportation, including rail, truck, and vessel, the advantages afforded by each must be fully understood. A detailed knowledge of the costs of moving a particular commodity by the several methods is also essential if the economic method of transportation is to be selected. It is unfortunate that at present comparisons must be based on rates rather than costs, as the definite costs of moving cargo by the various methods have not been accurately evaluated to permit positive comparison. It is clear that past capital expenditures should not be taken into consideration except as they directly affect the present cost of moving cargo.

● Investment Costs

In determining the advisability of the Federal Government undertaking a waterway improvement, careful consideration must be given to its comparative value in the commercial life of the nation. Two capital expenditures must always be considered in this study. The first of these is the appropriation of public funds that will be required for the execution of the project and its subsequent maintenance. The second is the estimated entire cost of the project to include interest charges, amortization, and the cost of terminal and transportation facilities. This latter expenditure must be compared with the capital value of anticipated benefits.

If the project under consideration has already been improved by the Federal Government, only the additional cost of the improvement under study should be considered as a capital charge for comparison with the increased return to be anticipated from the improvement. The Federal investment must include the estimated expenditure for new work of construction, to include all aids to navigation provided in connection therewith and interest during construction. The annual carrying charge must include interest on this investment increased by the annual sum required for amortization of obsolescence and depreciation, and for maintenance and operation.

The non-Federal investment must include all contributed funds, the value of lands and rights-of-way furnished by local interests, the estimated cost of reconstruction or alteration of bridges and other structures, the cost of terminal and transportation facilities that must be provided if the project is to serve the public fully, and the interest on these items during the construction period. The carrying charge of the non-Federal investment must include interest on the investment, loss of taxes on land and property transferred to Federal ownership, and the annual sum necessary for amortization, maintenance, and operation, less the net estimated return from public terminals and facilities included in the investment total.

The sum of the annual carrying charges on the Federal and non-Federal investments is the full carrying charge on the project, which must not exceed the estimated annual savings in transportation costs if the project is to be considered as economically warranted.

● Transportation Cost Savings

The annual savings in transportation costs that will be derived from the proposed improvement cannot be determined precisely, but must be estimated with sound judgment after detailed study. In some cases an improvement may be clearly justified in the interests of safety and convenience to established navigation, although its worth for this purpose cannot be evaluated. For example, the removal of a rock bar hazardous to existing shipping may be essential to the safety of that shipping, although its removal could not result in any increased commerce. The decision to undertake such an improvement must be based on sound business judgment.

In the normal case, where the improvement establishes new transportation facilities competing with existing facilities, a thorough investigation must be made to develop that portion of the available commerce which may be reasonably expected to use the improved waterway and the savings in transportation costs that will result from this diversion.

To determine these savings, the probable transportation costs for the movement of this commerce must be determined as accurately as possible for comparison with the existing transportation charges being made by the public for its movement. These transportation costs must include a reasonable profit to the carrier, terminal and transfer charges, and anticipated storage charges while the cargo is awaiting transhipment. The difference between this estimated cost of moving the commerce over the new route and the existing cost for moving that cargo represents the annual benefits or savings. This difference must show a substantial margin over the total estimated carrying charge sufficient to absorb any charges that may accrue as commerce is being developed, and leave a net return to the public when the commerce is developed.

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*Abstract of an address before the 25th annual meeting of the American Association of Port Authorities, Inc., at San Francisco, September 30, 1936.

Mathematically, this determination would appear simple. In actual practice it is complicated under the most favorable conditions, in view of the lack of accurate basic information with respect to actual transportation costs. Moreover, the economic pattern as a whole must be considered in determining the desirability of the improvement.

Frequently, the improvement of a particular port that would offer many local advantages would develop no new commerce, but would cause a diversion of existing commerce from neighboring ports already improved, with a consequent economic loss in handling commerce at both ports. The ability of existing ports and facilities to handle the potential water-borne transportation of their hinterland is always an important factor, and benefits secured at the expense of such facilities are of doubtful national advantage.

The future of the various transportation facilities serving the nation is difficult to forecast with accuracy, although it would appear axiomatic that all forms are essential to meet our agricultural and industrial requirements. It would also seem clear that any specific transportation route can survive only if it serves a public need in the movement of cargo at the lowest possible cost, and the abandonment of a facility that does not serve this purpose cannot be indefinitely postponed by complicated rate structures. The compilation of accurate data with respect to basic costs is of immediate importance, and essential to an accurate analysis of any facility.

A Reconditioning Record

Fourteen days after her arrival at New York, the Munson Line steamship Pan America had undergone an extensive reconditioning at the Robins Plant of Todd Shipyards Corporation and was at her pier ready to take on passengers and cargo for her next sailing to South America. Experts concede to the Robins Yard another record for speed and efficiency in ship reconditioning, especially at a time when continuity of service is of the utmost value.

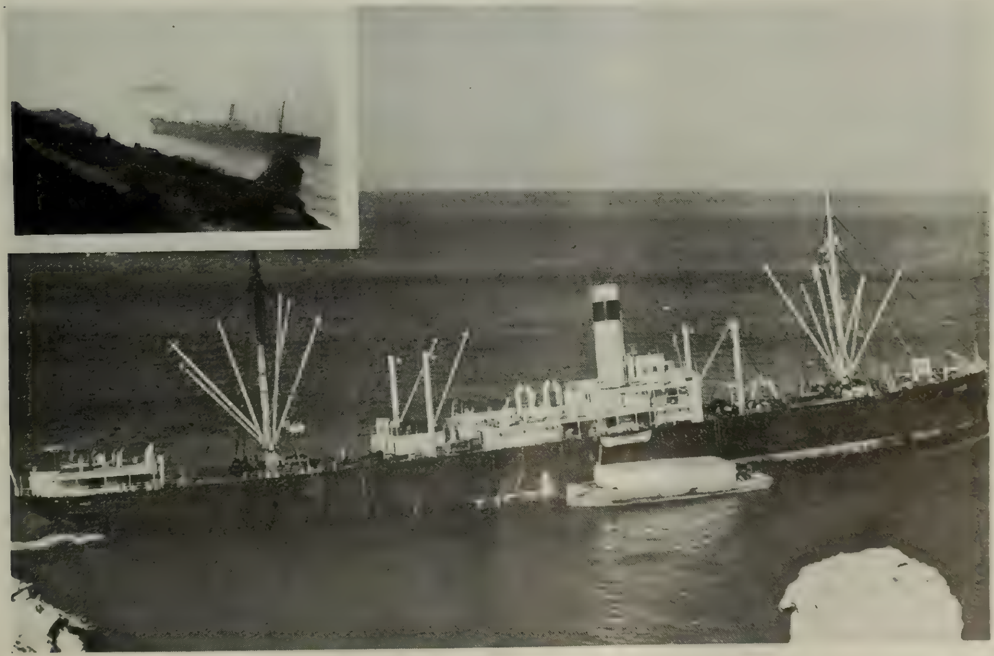
When the Pan America sailed, she was equipped with a new swimming pool, her dining room had been equipped with an air conditioning system, she had been dry docked, cleaned, and painted, and various other overhauling work had been carried out. The shade deck had been extended 28 feet for the full width of the ship. A complete steel deck was installed, including beams, plating, girders, coaming, cauked wood deck covering, and the necessary rails and ladders.

The swimming pool was formed by trunking in the hatches of No. 7 hatch with steel to the lower deck and fitting it with a hinged watertight bottom. The swimming pool bottom also serves as the hatch cover and, when the vessel is in port, the pool is emptied and the bottom opened to permit the loading and unloading of cargo. Teakwood gratings and platforms, ladders, lifelines, underwater lights, beach chairs, tables, and umbrellas were installed, and to complete the smart beach deck appearance, the winches were enclosed in steel bulwarks and booms restowed up the masts.

Air conditioning of the dining saloon necessitated the removal of the after dome over the saloon, plating it over, and repaneling the ceiling after the metal ducts for distributing air had been installed. The cooling unit was dismantled and cleared out and new men's and women's rest rooms were installed on the new deck plating over the dining saloon, together with necessary piping, tiling and fixtures.

The changes involved a considerable amount of new and altered electric and pipe connections, insulation work, and interior painting and decorating.

The old smoke stack was removed and a new stack installed and completely connected up. The final detail was an inclining test for stability, which the ship passed with ease.



During the night of October 7 in a dense fog, the American-Hawaiian intercoastal cargo carrier Ohioan came ashore just south of Point Lobos, inside the famous Seal Rocks. Our illustration, from a photo by Wm. Schoeb, shows a close-up from the bluff taken October 21. The inset, from a snap taken by A. W. Dickie, shows her position relative to outer Seal Rock. Cargo is being salvaged and Captain Leb Curtis is said to have a contract for taking off the hull on a "No Cure No Pay" basis.

Port of Portland Notes

● Apples and Ties.

Apples, pears and railroad ties have been important items of export from Portland this fall. Loading of 172,000 boxes of fresh fruit during September, and that much more during the first two weeks of October, indicated that the fruit movement from Portland this year will be exceptionally good unless labor developments interfere too much.

Railroad ties for China have been loaded by several ships, particularly the Danish motorship Nordpol and the British freighter Imperial Monarch, each of which took a full cargo. Dant & Russell, exporters of most of the ties, reported orders on hand for at least two cargoes a month for several months.

● Shipping Club.

Portland Shipping Club is well underway in its 1936-37 program, with committees functioning smoothly under the general direction of President Harold K. Cherry.

The October 14 meeting was addressed by John W. Kelly, Washington, D.C., correspondent of The Oregonian, who told some "off the record" stories that didn't get into the newspapers. Another meeting is planned for mid-November, while the annual party will be held December 19, according to announcement at the October meeting.

Committee chairmen appointed by Mr. Cherry included: Barney K. Frank, of Pacific Export Lumber Company, membership; Edwin A. Gardner, States Steamship Company, publicity; G. C. Anderson, Canadian Pacific Steamships, entertainment; and Dr. R. C. McDaniel, golf.

Officers for this year are: Mr. Cherry, Swayne & Hoyt, Inc., president; A. M. Scott, Pillsbury Flour Mills, vice-president; R. E. Ferguson, Jones Stevedores, Inc., treasurer; and Don Smith, United States National Bank, secretary.

Directors include: A. B. Natland, Matson Line; Willis K. Clark, States Steamship Company; L. W. Harwood, Lloyd's Register of Shipping; A. H. Jones; Alex J. Chalmers, Chalmers Shipping Company; and B. K. Frank, Pacific Export Lumber Company.

● Foreign Traders Elect.

Nineteen Oregon and Southern Washington foreign traders were elected directors in the Columbia River Gateway Foreign Trade Association at its annual meeting, held at the Evergreen Hotel, October 13.

They were: A. C. Albrecht, A. M. Scott, H. E. Waterbury, J. S. Campbell, Irwin Adams, Lloyd Wentworth, Willis K. Clark, L. W. Hartman, Fred H. Chapman, H. W. Kline, George F. Baker, and John F. White, all of Portland; Tony Sandoz, Astoria; F. H. Gowdy, Longview; Eberly Thompson, Vancouver; John Duckwall, Hood River; W. S. Nelson, The Dalles; W. T. Jenks, Salem; and Gordon Green, Medford.

The meeting was addressed by William T. Moran, assistant vice-president of the National City Bank of New York, on the money and foreign trade policies of various nations. Other speakers included: Mayor Joseph E. Carson, of Portland; Mayor Joe Breckel, of Vancouver; Charles Reed, assistant secretary of the State of Washington; C. A. Perkins, president of the Vancouver Chamber of Commerce; and H. E. Waterbury, district manager of the Bureau of Foreign and Domestic Commerce.

● Bids Rejected.

Uncle Sam wants to dispose of the old United States engineers' survey boat Geo. H. Mendell, which cost about $40,000 to build and equip, but not for such a paltry sum as $1877.77. That was the highest bid offered for the boat at Portland when bids were opened October 13, but it was rejected by the district engineer's staff, which indicated that an amount nearer the boat's book value of $5,000 would be entertained.

The Mendell was originally built in 1889 to tow rock barges engaged

The grotesque monster at left is just a bulk wheat cargo trimming board operator up for air. At right is the river front of the new general cargo terminal at Vancouver, Washington.

in construction of the Columbia River jetties, but was rebuilt in 1912 for survey work. She was recently replaced by the $200,000 motorship Robert Gray.

● Vancouver's New Dock.

Preparing to greet the expected development of river traffic on the Columbia River with adequate berthing and storage facilities, Portland's neighbor, Vancouver, Washington, is completing a $300,000 general cargo terminal facing the Columbia River a few hundred yards west of the new grain elevator.

The new terminal, erected by the Port of Vancouver with the assistance of the PWA, has a length of 862 feet and overall width of 201 feet, with a modern building 740 feet long and 120 feet wide. The front apron, 35 feet wide, carries two railroad tracks, while a 45-foot roadway at the back faces upon a loading platform at tailgate and car-door height. A modern marine elevator is provided for handling riverboat and barge cargoes.

A feature of the terminal is the warm storage space provided in three large rooms for the storage of about 10,000 tons or 400,000 cases of canned goods at controlled temperatures.

Construction was started last May and is to be completed early in November. George H. Buckler Company, Portland, has the contract. Port of Vancouver subscribed $180,000 of the cost through a local bond issue, while the PWA furnished the rest of the funds.

C. L. McKinley is president of the port commission, and J. H. Wheeler and H. J. Kessler are members.

● Columbia Freight Service.

Recent granting of a common carrier certificate for operation of a freighting and barge service on the Columbia River, between Portland and The Dalles, to the Inland Navigation Company by the Interstate Commerce Commission, was considered one of the greatest forward steps yet taken for development of freight services on the river.

The commission authorized the company to establish, before May 1, 1937, through routes and joint rates with competing railroads in interstate and foreign commerce of grain, grain products, and petroleum products, particularly between eastern Oregon and Vancouver, Washington, and Portland.

The Portland dock and bulk cement storage plant of the Santa Cruz Portland Cement Company.

The company, under conditions laid down by the commission, must actually engage in operation on the river not later than February 15, 1937, and provide terminal facilities at The Dalles before that date.

These provisions of the certificate were contemplated by the company, which is now building a 190-foot diesel boat of new and radical design in Seattle, and also assembling steel and materials for a terminal and oil storage tanks at The Dalles, expecting to have both the boat and terminal facilities ready this winter.

Officers of the company are: R. S. Whaley, president; J. L. Hyneman, manager; and George Gronvold, chief engineer, all of Seattle.

● River Excursions.

Operation of larger and better steamers for excursion and passenger service on the Columbia River next year is anticipated by Ralph J. Staehli, manager of the Bonneville Navigation Company, after a very successful season this year.

Operating the river boats Cascades and Northwestern for Sunday and holiday excursions to Bonneville, Staehli declared that more than 8200 persons availed themselves of the opportunity to see the famous Columbia Gorge from the river itself.

The excursion operator said plans are being made to charter one or two boats from Puget Sound for next year's operations. The steamer Watco, built several years ago for passenger ferrying between Cathlamet and Astoria, will be reconditioned and operated on Lake Bonneville as soon as sufficient water backs up behind the new dam to make passenger service feasible, he said.

● Wheat Out and Corn In.

The once familiar figure of a trimmin' board man, begoggled and chaff-covered, emerging from the dusty hold of a wheat-loading steamer, is again being frequently seen at Portland's grain docks this season.

From July 1 to mid-October, Portland wheat loadings totaled 3,200,000 bushels, of which nearly 1,000,000 bushels were dispatched to foreign ports. Europe, notably Rotterdam and Liverpool, were the leading foreign buyers, although Italy entered the market for a shipment of about 165,000 bushels.

At some of the same docks down which wheat shot from loading spouts, corn ships direct from Argentina discharged their cargoes of yellow maize. Notable among these shipments was a 9000-long ton cargo brought by the Dreyfuss steamer Lina L. D. October 14, while the British freighter South Wales discharged 2850 tons the same week. Nearly 500,000 bushels arrived at Portland docks that week, boosting the port's corn receipts since January 1 to nearly 1,900,000 bushels.

The **Hammond Shipping Company** recently announced an expansion in its service to Portland. Under a managing operating agreement, the Hammond Shipping Company has added the steamer Point Loma to its fleet of coastwise carriers. The Point Loma made her first sailing from Los Angeles Harbor, northbound, Wednesday, October 28. Of all-steel construction, the Point Loma is in the same classification as the present ships in the Hammond Shipping Company fleet.

The Point Loma will hereafter make regular schedule and calls in the coastwise service.

Seattle Shipping Briefs

Former Navy collier Jason at the plant of Todd Seattle Dry Docks, Inc., just before she began her long voyage to New York in tow of the tug Roosevelt, of the California Towing Company. The Jason has been stripped of her coal handling gear and propeller.

● Long Tow.

In tow of the tug Roosevelt of the California Towing Company, the former Navy collier Jason left Seattle Tuesday, October 20, bound for New York. The Jason has been at the plant of Todd Seattle Dry Docks, Inc., several weeks preparing for the long tow. The 23-year-old vessel recently was sold by the government to Boland & Cornelius of Buffalo, New York, for $75,000. She has been stripped of her coal handling gear and propeller. Sidney E. Smith, of Buffalo, vice-president of Boland & Cornelius, has been in Seattle arranging for the long voyage of the vessel. The Jason is to be rebuilt by her new owners, who operate a fleet of colliers on the East Coast. The latest type of conveyors will be installed and other improvements made in the vessel at a cost estimated at $700,000.

The Jason was built at the plant of the Maryland Steel Company, at Sparrows Point, Maryland, in 1913. She is a twin-screw, double funnel ship with engines of 7,000 horsepower.

● Harbor Congress.

Bellingham was selected for the 1937 convention of the Northwest Rivers and Harbors Congress at the fifteenth annual meeting of the organization, which closed in Everett October 17. H. W. Hunter, of Bellingham, was elected president; J. H. Wheeler, Vancouver, Washington, first vice-president; Horace P. Chapman, Seattle, second vice-president; H. W. Davies, Port Angeles, treasurer; and Alex D. Stewart, Seattle, secretary. About forty delegates, representing fourteen Northwest ports, attended the sessions.

● Dock Improvements.

Bids for rebuilding Colman Dock, on the Seattle waterfront, and converting it into a modern ferry terminal, were received October 30. A ferry slip, similar to the one on the north side of the dock, will be built on the south side of the structure. The plans call for a new waiting room, new ticket office, new offices for the Puget Sound Navigation Company, concessions for other firms on the second floor of the dockhouse, parking lanes for automobiles on the ground floor, and turnstiles for passengers. Specifications have been prepared by Arthur Loveless and Lester Fey, Seattle architects.

● Corn Import Problems.

While Midwest farmers may have had a hard year the government is doing nicely in the corn business. The Greek steamship Marionga, in Seattle recently from Argentina with a full cargo of 6,800 tons of corn, paid $68,000 for the privilege of putting the grain ashore, for it is assessed a duty of $10 a ton. The Greek steamship Nellie, which discharged 4,000 tons of Argentina corn in Tacoma, paid $40,000 into Uncle Sam's coffers.

Greek and British skippers arriving here in corn ships from Argentina say they do not understand why Pacific Coast ports don't get modern facilities for discharging the large shipments of grain which have been arriving for many months.

In all Pacific Coast ports, the corn is being put ashore in clamshell buckets, working one hatch at a time. The Marionga arrived in Seattle October 8 from Rosario. She was fumigated and on October 10 began discharging her corn. It will be October 26 before the last of the shelled corn is scooped out of the vessel's holds and deposited in a hopper ashore.

The Marionga took just two days to load the 6,800 tons of corn at Rosario. The vessel has five hatches, but could work only one at a time.

● Bark Monongahela Sold.

Mrs. Patricia B. Warren of Seattle, daughter of the late Captain James C. Brownfield, pioneer of the Puget Sound towing fleets, has the shipping men of the Coast guessing. Mrs. Warren recently purchased the four-masted steel bark Monongahela in San Francisco from the Charles Nelson Company for $8,600, but she won't say what she is going to do with the vessel. Mrs. Warren is president of the Georgia Company, Seattle towing firm, and directs the operations of this company from offices in the National Building, 1008 Western Avenue, Seattle. It is reported that the Monongahela will be converted into a barge and used in the transportation of logs from British

Columbia to Puget Sound.

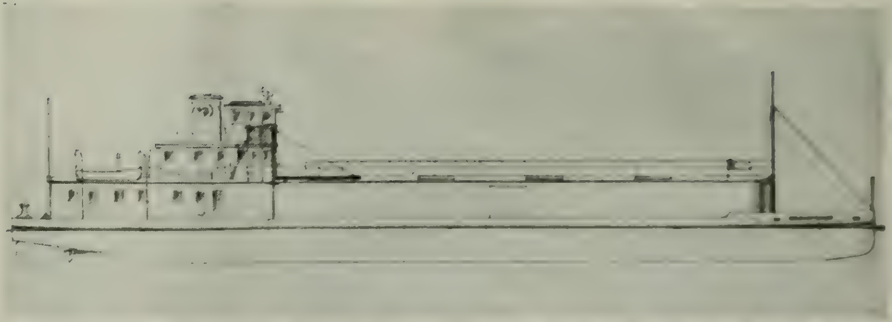
Louis Dulien, president of Dulien Steel Products, Inc., of Seattle, who was one of the bidders at the sale of the sailing vessel in San Francisco, said that if he had obtained the bark he would have loaded her with steel and sent her to Japan under sail to be scrapped.

● Welded Steel River Boat.

The steel tunnel-bottom, twin-screw, electric welded river boat being built at the plant of the Western Engineering Corporation in Seattle for the recently organized Inland Navigation Company, which will operate on the Columbia and Snake Rivers, eventually as far as Lewiston, Idaho, is taking form and will be launched about December 15. The vessel will represent an investment of $260,000. She will be christened Inland Chief. Her dimensions are 190 feet long, with a beam of 38 feet and a maximum loaded draft of 7½ feet. Cargo capacity will be provided for 300,000 gallons of gasoline or 810 tons of wheat. The gasoline will be transported upriver and the wheat down.

The Inland Chief will be propelled by two 600-horsepower diesel engines, and will be so constructed and powered that she can push six barges ahead of her on her river trips.

The Inland Navigation Company is financed by Ralph S. Whaley, formerly of Spokane, and Howard A. Dent, formerly of Lewiston. Jack L. Hyneman of Seattle is general manager of the Company. G. Kobrow, naval architect, designed the vessel, and is supervising her construction.



Outboard profile of the $260,000 tunnel-bottom, twin-screw, electric welded, steel river boat Inland Chief, being built at the plant of the Western Engineering Corporation in Seattle for the Inland Navigation Company.

● Shipping Briefs.

The Interocean Steamship Corporation has leased Pier 6 on the central waterfront in Seattle from the Arlington Dock Company, and in the future vessels of the Interocean Line and the Knutsen Line, for which Interocean is agent, will berth at this terminal. Vessels of these services formerly berthed at Pier D and more recently at the Milwaukee Ocean Dock. Pier 6 formerly was occupied by the McCormick Steamship Company.

Captain Franz Schulze, of San Francisco, Pacific Coast marine superintendent of the Hamburg-American Line, Mrs. Schulze, and their son, Edgar, recently made a motor tour of the Northwest. They arrived in Seattle on the German steamship Vancouver, bringing their car with them. While the vessel was loading on Puget Sound, they visited Mount Rainier.

Seattle, as shown in this beautiful night view, is one of the best lighted cities in the country.

John G. Nordgren, who was general freight agent in Seattle for the McCormick Steamship Company, has taken over the duties of Puget Sound district manager, succeeding **E. C. Bentzen,** who has resigned. Bentzen left the McCormick Steamship Company to head a newly formed company. The nature of the business he will engage in will be announced in the near future. Nordgren started his shipping career in May, 1928, checking freight on the dock in Portland. He was promoted solicitor in the traffic department and then to general freight agent in Portland. September 1, 1934, he was transferred to Seattle as G. F. A.

A. J. McLean, chief clerk in the operating department of the Alaska Steamship Company, will arrive in Seattle Wednesday, October 21, on the company's steamship Yukon, after his first trip to Alaska. For the past eighteen years, McLean has been employed by the Alaska Line at Pier 2 in Seattle. During all of that time his duties have concerned the operation of the company's big fleet of ships, linking Seattle with a range of ports extending from Ketchikan to the Arctic. Shippers and travelers have marveled at his intimate knowledge of routes and cannery and saltery ports off the beaten path followed by ships. He must have spent much time in the north, they supposed. Now Mr. McLean has seen Alaska and will have a still greater knowledge of the Northland. The Yukon visited all of the important ports in both Southeastern and Southwestern Alaska.

Refrigeration on Roller Bearings

Top: Tuna clipper Hermosa at dock. Center: Her engine room, showing Globe compressor. Bottom: Norma-Hoffmann roller bearings.

The larger fishing boats of the Pacific Coast, and especially those units which travel far a-sea after the great schools of tuna, must have dependable auxiliary machinery if they are to function efficiently in their job of deep sea fishing and bringing the produce of that fishing home to market in prime condition. One of the most important auxiliaries in these vessels is the refrigerating unit, which maintains the proper temperatures in the fish holds and in the refer box for perishable foods for the crew.

The wooden steamer Hermosa, built at Wilmington, California, in 1902 and operated as a passenger and cargo vessel to Catalina Island, was bought by Wm. J. Maggio of San Pedro and converted into a diesel driven tuna fishing boat. Her dimensions (139 feet long by 28 feet beam by 11 feet depth) were the largest in the California fishing fleet, and every effort was made to equip her with the most dependable machinery obtainable.

Globe mechanical refrigeration, as built and installed by the Globe Ice Machine Company, of Los Angeles, was chosen to take care of fish cargoes and other refrigeration needs on this ship. This firm has built up an enviable reputation for the quality of its products through the policy of careful design, construction, and assembly of all detail items. Due to this policy, Globe Ice Machine products have registered unusually trouble-free service over long periods of time.

The heart of any refrigerating unit is the compressor. The Globe compressor, as installed on the Hermosa, is belt driven by an electric motor. All cylinder blocks, shaft case, heads, and other cast parts are of special nickel manganese semi-steel, and only metal from first cupola heat is used. This insures uniformity and high quality of metal. Every casting is rigidly tested and carefully inspected in the rough and after machining. The eccentrics which drive the pistons of this compressor are machined and ground in precision tools for a pressed fit over the steel shaft to which they are keyed. It is obvious that the bearings on which this shaft runs are among the most important detail items in the compressor. If these bearings are the least bit out of line, if they bind in any way, the compressor will not function properly and the whole refrigerating system will fall down on the job.

Knowing that the smooth continuous year-after-year performance of their compressor depends entirely on the efficiency and dependability of the eccentric shaft bearings, the Globe Ice Machine Company chose Norma-Hoffmann Precision Roller Bearings for this duty. That these bearings have made good on the job is a matter of record. Through fair weather and foul, on the weaving, straining wooden hull of this 34-year-old vessel, the Globe compressor and its Norma-Hoffmann bearings have functioned perfectly—fish cargoes have been brought to the cannery in excellent condition — the fishermen on the ship and her owners have been assured fair opportunities for profits.

New Diesel Drive Auxiliary Power Generating Set

The Western Engine Corporation, of Los Angeles, has recently placed on the market a very well designed small diesel engined auxiliary generating set that is peculiarly adapted to take the auxiliary power and lighting loads aboard yachts and fishing boats that are propelled by diesel engines.

The new unit is termed a Western D-10 model. Its engine cylinder has a bore of 4½ inches and a stroke of 6 inches. This engine will be built in 2, 3, 4, and 6 cylinder sizes. At 1000 r. p. m. these engines develop 10 horsepower per cylinder, so that the range of capacities is from 20 to 60 horsepower in single units. Direct connected to direct or alternating current generators, the electric outputs range from 14 to 45 kilowatts.

Type D-10 is a very neat, completely enclosed modern high speed heavy duty engine fitted with a speed control governor that functions perfectly within the limits necessary for steady lighting conditions.

Echoes From the Fishing Banks

Fathometer has become practically standard equipment on the tuna clipper type of fishing vessel.

Large fishing vessels on the Pacific Coast and throughout the world are adopting the Fathometer as an indispensable part of their fishing and navigating equipment. Trawlers, seiners, and tuna clippers represent large capital investments for their owners, both in the ships and in their gear.

In locating fishing grounds for the trawl and purse seine nets, depth of water under the boat is a prime factor in determining nature and size of haul. Until the Fathometer was developed for fish boat use, the common practice was to get the depths by the slow, laborious process of heaving the hand lead line. To take a 50 to 100 fathom sounding by hand lead line, the boat must be stopped and the leadsman given several minutes to make the measurement.

The Fathometer model used by the fishing boats registers any depth from two fathoms to 250 fathoms. This model will give visual signals of the depth of water below the keel. In water of 100 fathoms or less the depth is indicated 20 times a minute. For all practical purposes, therefore, the Fathometer gives instantaneous soundings of depth of water below the keel when the boat is traveling at the slow speed desirable for trawling operations. In fact, at any of the speeds used by commercial fishing boats the soundings are instantaneous and practically continuous inside the 100 fathom line.

First application of the Fathometer to the fishing industry on the Pacific Coast was made at San Francisco early in 1932 on the trawler Catherine Paladini, owned by A. Paladini, Inc. After a year's trial use of the instrument it was purchased by the owners, who promptly thereafter installed a unit on another trawler of their fleet.

Captain P. F. Keough, of the Catherine Paladini, is a very enthusiastic booster for the automatic sounding device. His records show:

That the use of the Fathometer saves about two hours a day in locating the fish banks. They are therefore able to make longer drags or one more drag per day, thereby averaging more fish. Since this saving of time is for two boats, their crews, and very costly net gear, the two hours represent considerable outlay.

That navigating with the Fathometer by the charted irregularities of the bottom (while drifting or trawling in the fog, or while entering or leaving port in the fog) is a great time saver and an insurance of safety.

That the more perfect check on the bottom is often a means of saving costly nets and gear from damage or total loss.

The successful fishing record of the Paladini trawler soon became known up and down the Coast, and today many purse seiners, tuna clippers, and trawlers are navigating the Coast and locating fishing banks by the echoes from the bottom as indicated by the red flash on the Fathometer scale. Many an experienced fisherman will testify that this instrument is the most important piece of equipment in his vessel.

The Fathometer is manufactured by the Submarine Signal Corporation, of Boston, Massachusetts. This firm maintains an office in San Francisco and a factory installation and service representative, A. M Scudre. C. V. Lane is sales representative at San Francisco.

Marine Insurance Review

Safety on American Merchant Marine

By Captain Thomas Blau,
Port Captain, Grace Lines

Taking exception to a sweeping condemnation of the American Merchant Marine by Captain J. H. Tomb, U.S.N. (retired), Captain Thomas Blau, Port Captain of the Grace Lines, declared that such broad statements are especially injurious to American lines which are striving to maintain efficient operation and place the merchant marine on a par with any nation.

Captain Tomb, in a speech before the National Safety Congress and Exposition in Atlantic City, recently branded the American Merchant Marine as "a travesty on safety at sea," and declared that "American ships do not hold lifeboat drills to train their crews."

Denying that either of these statements is true, except in perhaps a few isolated instances, Captain Blau said: "Usually such statements come from professional yachtsmen, but coming from a man with Captain Tomb's background as a naval officer and as superintendent of the New York State Merchant Marine Academy, they are amazing, to say the least.

"Speaking for the Grace Lines, I want to state emphatically that we do hold regular boat drills; that our crews are as efficient as those on any line, and that our record for safety defies comparison.

"The official records of the American Merchant Marine over a long period of years will show that it is second to none for safety. This record belies the statement that our men are not trained, because efficiency and safety at sea depend on well-trained officers.

"As for the officers of the Grace Lines, they are impressed with the fact that they are responsible for the safety of their passengers, their vessel and the cargo. They are under strict orders to hold regular fire and boat drills and to lower lifeboats in port and at sea, at stated intervals, for regular training of the crews. Our logs will show that they carry out these orders faithfully.

"Captain Tomb also criticized the type of seamen in the American Merchant Marine today, stating that 'we are placing too much dependence on the alien mariner.' This statement is erroneous insofar as the Grace Lines are concerned. More than eighty per cent of our crews are either American born or naturalized citizens.

"He stated that when an American ship reaches the home port, 'the personnel before the mast is discharged and another entirely new crew signed on a few hours before starting another voyage.' This is not true in the Grace Lines. As a matter of fact, our turnover is only between seven to 10 per cent for each voyage.

"Regarding the manning of ships, we man our vessels far above the required scale. For instance, on our 10,000 ton vessels we carry four senior officers, where only three are required. We also carry two junior officers and two cadets. We are required to carry only two cadets and no junior officers.

"I have been in shipping, at sea and ashore, for 43 years, and I think I can speak as an authority when I say that the present inspection laws for the American Merchant Marine are as rigid as any maritime laws I have ever seen, and the inspectors are as strict as any I have ever met in any port.

"If Captain Tomb, in making his sweeping statement, had any particular lines in mind, he should have named them rather than condemn the entire American Merchant fleet, as we of the Grace Lines feel that we have as good, if not better, vessels than any line, American or foreign, and that our crews are as well trained."

Steward Department Safety

Ship management should give the steward department's functioning the same degree of consideration to insure safety that it devotes to safe navigation from the bridge and proper handling of the engine room machinery, Robert F. Hand, assistant general manager, Marine Department, Standard Oil Company of New Jersey, told Safety Congress delegates at the Marine Section of the 25th National Safety Congress at Atlantic City October 6.

The speaker pointed out that on some ships the rate of accident frequency in the steward's department is even higher than in other departments where occupations are seemingly more dangerous. Carelessness of the individual, encouraged by lack of supervision, or improper supervision by the superior officers, are common causes of this high accident rate.

"The steward of an oil tanker, although not licensed, rates as an officer," he stated, "and is required by virtue of his position to forestall accidents within his personnel group in the same degree as are the mates

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and engineer officers in their respective departments. These key men often find their jobs made difficult, due to not receiving the unqualified and whole-hearted support of persons in charge at headquarters. Conditions of this kind are known to exist."

In industry only those accidents occurring during regular hours in the plant are counted as industrial accidents, but on shipboard the "off watch" accidents—which sometimes run as high as 15 per cent of the total — are checked statistically against the ship's accident record.

"In most industries the worker can go home after his day's labor is done—and if he should meet with an accident by slipping in his bathtub or on the cellar stairs and lay up for a time, such accident will not be reflected in the frequency record of that particular industry. This is not so, however, with the marine. Here, the man must remain on company property when he finishes his watch at sea.

"More careful selection of personnel would result in lower accident rates. So many shipping companies are satisfied to accept applicants for mess-boy and mess-man positions who merely wish to go to sea temporarily or are out for a lark. This type is hard to educate for safe practices. Such people are not interested in anything except 'wasting' a few weeks or months at sea to tide them over, and they do not care whether they stand in the company's good graces at the end of that time or not," Hand concluded.

Safety at Sea

(Continued from Page 386)

and included a provision, which was never operated, for noting on the vessel's certificate excess of subdivision better than the minimum. The present Convention fixes "permissible" factors of subdivision, which are the minimum acceptable subdivision, and retains the requirement of the 1914 Convention that "ships shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended."

The certificates do not show the extent of subdivision above the minimum permissible. They do not indicate any difference between the most efficiently subdivided ship and the one that just meets the permissible standard, and they do not indicate anything whatever as regards the subdivision of an existing ship. There is no difference shown on the certificate for an existing ship, to which the administration issues a certificate, no matter how great the relaxation granted to such ship, and on the certificate issued to the best subdivided ship afloat. The same is true as regards fire protection and life-saving appliances.

I propose that a subdivision rating and a safety rating considering foundering, also ratings referring to other safety provisions as may be found practicable, be established, and that these ratings be shown on the certificates and that they be shown with the other particulars of vessels given in lists and registers of shipping. Making that information public is consistent with the Convention preamble, relative to "uniform principles and rules"; it is consistent with Article 1, relative to giving the "convention full and complete effect"; and it is consistent with Article 58, relative to information communicated to other governments.

Explosion Tested Fan Cooled Motors

A new and improved design of Westinghouse type SK explosion tested, fan-cooled, totally-enclosed, direct current motor has recently been announced. Available in sizes from five to seventy-five horsepower and 115 and 230 and 550 volts, they are designed for use in locations where explosive gases or dust may exist.

The brushes and commutator are readily accessible, and the motor is designed with the fan on the commutator and so that a gear case, coupling, or pulley will not restrict ventilation. Accessibility is obtained by the use of a double walled bracket on the commutation end. This bracket is equipped with hand hole covers which are readily removable to permit inspection and adjustment of the brushes and commutators.

These motors are designed, built and tested to withstand the internal

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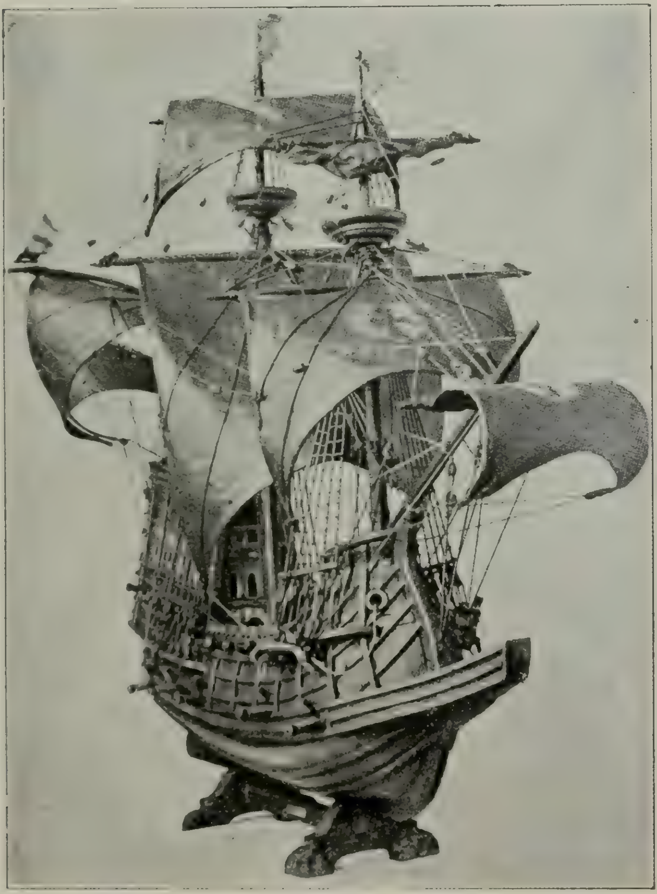

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explosion of gas (methane) or coal dust, without injury to the equipment and without emitting flames or sparks, which would ignite surrounding gas.

The presence of a fan on the commutator end, forcing a large volume of cooling air through properly located air passages, makes possible high continuous capacity with minimum size. Due to the unique design of the double walled bracket, mounting the fan on the commutator end is accomplished without interfering in any way with the accessibility to the brushes and commutator. Fans mounted on the shaft extension end are objectionable because they impose undue stress on shaft and bearings due to the increased distance between the point of application of load and the bearing, and because pulleys, belts, gear cases, and other connections restrict the flow of air to fan.

The patented double walled front bracket is equipped with four screw type hand hole covers, which are readily removable for inspection and adjustment of brushes or commutator.

To guard against the covers being removed by unauthorized persons, each cover is provided with a hole in the web for insertion of either a wire meter seal or chain and lock.

ROY C. WARD GEO. B. DINSMORE WILFRED PAGE
GEO. E. BILLINGS CO.
308-12 CALIFORNIA STREET, SAN FRANCISCO GArfield 3646
INSURANCE
BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

Marine Insurance Notes

British Appreciation. The master of the British steamer Gracia has submitted to the lighthouse superintendent at San Francisco the following report of his recent experience in the use of distance finding at two stations:

"I recently arrived at San Francisco from Columbia River, and when about 69 miles north of Blunts Reef Light Vessel encountered heavy fog, necessitating my keeping in touch with your stations for radio bearings. On approaching Blunts Reef Light Vessel, I hauled in to pass her about 2 or 3 miles off so as to pick up the whistle. When hearing this, and in cooperation with my radio operator, I was enabled to calculate my distance with the aid of your radiobeacon chart, so as to alter course for Point Arena, where I again found my distance off in the same manner.

"This is to let you know that I have found the facilities of the Lighthouse Service of considerable assistance, not only on the present voyage but previously as well, and wish to express my appreciation for the services rendered by your stations, and these facilities must also be very helpful to all mariners."

Ecuador Rules. A new insurance code for Ecuador was enacted in April of this year. Article 31 of this code deals with marine insurance in the following words:

"Insurance companies carrying on their lawful activities in Ecuador should have a preferential right to the marine insurances on cargoes bound for Ecuador. To this end Ecuador consuls, in cases where the companies concerned have agencies or branch offices in the ports of shipment, should always refuse to legalize the shipping documents when the merchandise has been insured in other companies, unless the latter have agents in Ecuador with power of attorney to take out reclamations on the part of the insurees and deposit with a bank operating in the country a sum of at least 50,000 sucres isued to the order of the "Superintendente de Bancos" in pledge for the fulfillment of their obligations."

A Bill from Norway. "In compliance with a decision on the part of the Norwegian Storting, the Norwegian Government have handed over a bill to the U.S. Foreign Office, in which compensation is demanded for the losses which the Norwegian shipowner, Mr. Christoffer Hannevig, has suffered as a consequence of the fact that the U.S. Government, in 1917, on account of the War, expropriated three large shipbuilding yards, 45 vessels that were under construction at the yards, and contracts aggregating 313,000 tons. As Hannevig did not get any compensation and naturally could not get the yards back, he failed. For 19 years negotiations and processes have been going on in this remarkable affair. Now Norway demands that Hannevig be paid a compensation of 3.8 million dollars. If U.S.A. does not agree to this arrangement Norway will demand that the case be taken up by the International Court at the Hague."

(Scandinavian Shipping Gazette.)

Prompt Settlement. On the afternoon of Saturday, September 26, a forest fire swept down on the town of Bandon, Oregon, and practically wiped out that lumber mill settlement. Up to Oregon from the head office in San Francisco, Fireman's Fund and affiliated companies sent general adjuster Frank W. White with a corps of assistants, including: Adjuster Frank Hayman, from the head ofice; special agents B. E. Nourse and Frank J. Brady, from San Francisco; Wylie Harding, from Sacramento; Floyd Lobree, from Fresno; G. Emory Moore, from Seattle; and John E. Meeke, Miller S. Farrell, and automobile adjuster Lloyd Wagner, from Portland. On Tuesday morning, September 29, adjusting headquarters were established in the fire house at Bandon.

By Saturday night, October 3, exactly a week from the outbreak of the fire, Fireman's Fund and affiliated insurance companies had paid all their losses on risks in Bandon and vicinity.

International Meeting. The International Union of Marine Insurance held its 70th annual congress at Ostend, Belgium, in September. The chief item of interest in a rich and varied program was the stirring appeal of Lord Essendon, British shipping magnate, for help from the international cargo underwriters in making the "Hague Rules" really international. The argument advanced was that the Hague Rules Ocean Bills of Lading place upon carriers a greater burden of responsibility, and grant to shippers greater concessions than any other form in use. That these advantages to the shipper are even more advantageous to the cargo underwriter. The cargo underwriter therefore should charge a higher premium for goods shipped under the old Bills of Lading forms, and so help to bring about the international acceptance of the Hague Rules.

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On the Ways—
SHIPS IN THE MAKING
LATEST NEWS FROM AMERICAN SHIPYARDS

World Shipbuilding

Lloyd's Register quarterly shipbuilding returns indicate that "there were 581 merchant vessels of 2,111,437 aggregate gross tons under construction in the world (excluding Russia) at the close of the quarter ended 30th September, 1936."

Of this program the United States' 90,960 gross tons is a trifle less than 4½ per cent of the total. Five nations take care of 85 per cent without the help of the United States. These are:

Great Britain and Ireland	219 ships, 928,571 gross tons.
Germany	112 ships, 424,264 gross tons.
Japan	58 ships, 175,801 gross tons.
Holland	43 ships, 140,475 gross tons.
Sweden	25 ships, 111,860 gross tons.

Thus we see that Great Britain is building ten times as much tonnage as the United States; Germany is building almost five times as much; Japan almost twice as much; and so on.

These tonnage figures, however, do not tell the whole story in the comparison of capacities. The compilation showing marine engines under construction in the world indicate that those building for the United States vessels total 64,146 horsepower, or 0.7 horsepower per gross ton. Contrast this with the figures for other national shipbuilding programs, which show as follows:

Holland	108,620 horsepower, or 0.77 per gross ton.
Great Britain	885,675 horsepower, or 0.95 per gross ton.
Germany	407,498 horsepower, or 0.96 per gross ton.
Japan	230,155 horsepower, or 1.3 per gross ton.
Sweden	157,020 horsepower, or 1.4 per gross ton.
United States	64,146 horsepower, or 0.7 per gross ton.

These figures indicate very roughly that the new ships of these five nations will have a decided advantage over our new ships in speed. They indicate (again very roughly) that the new ships of Japan and Sweden will have a sea-going speed at least 30 per cent better than that of the new American ships.

We are well aware of the fact that the present American shipbuilding program is composed practically 100 per cent of tankers to be used in carrying the products of their owners, and therefore the above comparison is in a sense pointless. However, the figures show very graphically the modern trend toward speed, and they should be of great interest to American shipowners and to those who are just now framing a program of shipbuilding calculated to build up the prestige of the American Merchant Marine.

One of the duties of the new Maritime Commission is to encourage the building of new American flag tonnage through shipbuilding subsidies and shipbuilding and reconditioning loans. Naturally, there will be some attempt made to standardize types of ships in order to cut down shipbuilding costs. There is danger that this standardization will be along lines so conservative that when our proposed new fleet is finished it will be obsolete.

American Bridge Constructing Barges

At the yard of the American Bridge Company, Pittsburgh, Pennsylvania, 20 coal barges 175 x 26 x 11 feet, and 3 dump scows 114 x 26 x 7 feet 9 inches are under construction. Fourteen coal barges 195 x 35 x 11 feet were in process of building, but six of these barges have been launched, leaving eight now under construction.

New Construction At Dravo Yard

The Dravo Contracting Company, Pittsburgh, Pennsylvania and Wilmington, Delaware, is building 20 welded type W-3 coal barges 175 x 26 x 10 feet 8 inches for stock, and has been awarded contract for four welded flush deck cargo box barges 100 x 26 x 6 feet 6 inches. The gross tonnage of the former totals 9440 tons; of the latter, 660 tons. There are also a number of other barges building, as well as several dredges and a towboat, construction of which has already been noted.

Ingalls To Export Barges

The Ingalls Iron Works Company of Birmingham, Alabama, has been awarded a contract for six oil barges by the International Petroleum Company, Ltd. (Tropical Oil Company), Toronto, Ontario, Canada. Three of these barges are 125 feet x 30 feet x 7 feet, and three are 150 feet x 30 feet x 7 feet. They are of special design, all-welded to Lloyd's Register of Shipping requirements for Class A River Service, and are for service on the Magdalena River, Colombia, South America.

Three of the barges have already been launched at Ingalls' shipyard at Chickasaw (Mobile), Alabama, on the Gulf of Mexico, and it is expected that the other three will shortly follow. Delivery of the barges will be made in the early part of November.

The barges are equipped with National Transit cargo pumps to be driven by shore steam lines, and are protected from fire hazards by steam smothering system, and, for the smaller barges, a Lux carbon dioxide fire extinguishing system as well.

Marietta Manufacturing Company Building Steamer for South America

On October 25 the Marietta Manufacturing Company, Point Pleasant, West Virginia, laid the keel for a stern-wheel river steamer 200 x 44 x 5 feet 6 inches. This vessel is being built for export to South America.

Federal Shipbuilding Launches Tanker

The tanker Pan-Maine, for the Pan-American Petroleum and Transport Company, was launched recently at the yard of the Federal Shipbuilding and Dry Dock Company, Kearny, N.J. Mrs. Robert E. Wilson was sponsor, and Mrs. William B. Leach matron of honor.

Destroyer Case Commissioned

Commissioning of the destroyer Case, DD370, has been announced by the United States Navy Yard, Boston, Massachusetts. The Case is 334 feet long between perpendiculars, 35 feet beam, and 19 feet 8 inches deep. Keel was laid on September 19, 1934, and the ship was launched on September 14, 1935.

The yard has also been awarded a contract to build two more destroyers, DD415 and DD416, details of which are not yet available.

Campbell Building Seven Tuna Clippers

Seven tuna clippers are in process of construction at the yard of the Campbell Machine Company, San Diego, California, completion dates for which range from November, 1936, to March, 1937. The vessels are from 75 to 135 feet in length, will be powered with Union diesel engines of from 190 to 600 horsepower, and are building for various Pacific Coast owners.

Aircraft Carrier Enterprise Launched

The U. S. S. aircraft carrier Enterprise was launched at the Newport News Shipbuilding and Dry Dock Company yard, Newport News, Virginia, on Saturday, October 3. A large assemblage gathered to see the vessel slide down the ways, the Enterprise being one of the more important naval ships of recent construction.

Todd Completes Reconstruction of Stuart Dollar

Reconstruction of the Stuart Dollar, 10,200-ton freighter of the American-Hawaiian Steamship Company, has been completed at the Todd Seattle Dry Docks, Inc., Seattle, Washington, at a cost of $100,000, the work requiring forty days for completion. The Stuart Dollar has been renamed Floridian, and will be operated in the intercoastal trade as a unit of the Williams Line fleet, subsidiary of the American-Hawaiian Steamship Company. The vessel was purchased from the Dollar Steamship Lines after lying idle for more than two years in Lake Union.

Sludge Vessels to be Built by New York City

Plans and specifications for the construction of from one to three diesel propelled sludge vessels at an estimated cost of $1,000,000 each have been issued by the Department of Sanitation of the City of New York. Cox & Stevens, Inc., 521 Fifth Avenue, New York, naval architects, are the designers.

The vessels will be of steel construction, with twin screws driven by two 650-horsepower diesel engines developing a speed of 10¼ knots, and will have a length on load waterline of 250 feet, moulded beam of 43 feet 6 inches, moulded depth amidships of 16 feet, cargo deadweight capacity of 1,600 short tons, and mean draft of 11 feet. Operation of engine room pumps, compressors, oil purifiers, lights, etc., will be secured by the installation of two 40 k.w. generators.

Provision will be made for a crew of 17 and fuel oil storage space sufficient for a cruising radius of 2,500 miles.

Bids for United States Lines Vessel Submitted

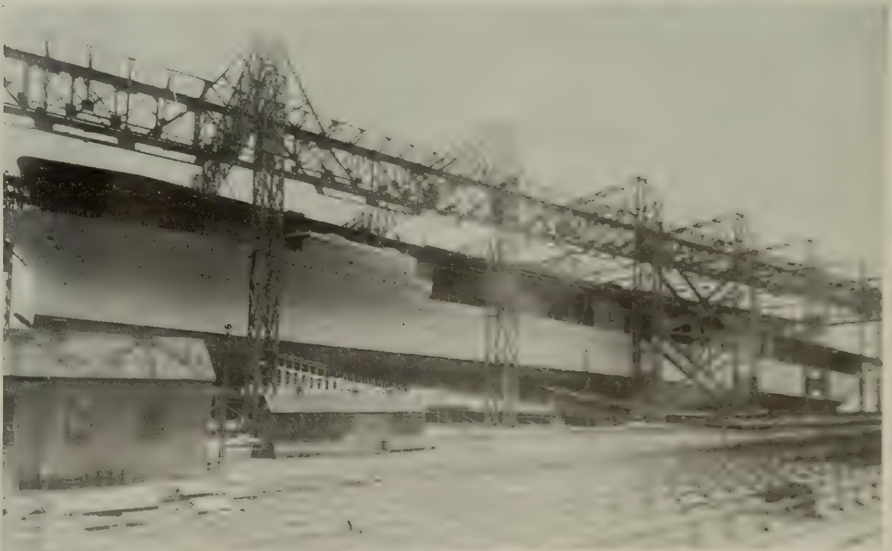
Proposals from the New York Shipbuilding Corporation, Camden, N.J., and the Federal Shipbuilding & Dry Dock Company, Kearny, N.J., have been received by the United States Lines. These proposals are for the construction of a vessel duplicating the Washington. The New York Shipbuilding Corporation submitted a price of $12,995,000; with improved machinery, $13,095,000; the bid requiring 32 months from date of contract to date of delivery. The Federal Shipbuilding & Dry Dock Company based its bid on an improved similar type of vessel, the bid amounting to $16,500,000; assuming risk for increased cost of material and labor, $17,500,000; 36 months being required for completion of the ship.

Bids have been forwarded to the Department of Commerce, Washington, by officials of the United States Lines.

Quick Reconditioning Job Done By Todd

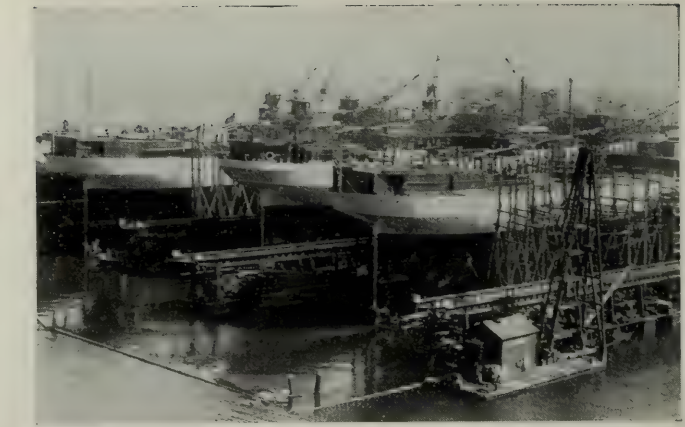
The Munson Line steamship Pan America underwent extensive reconditioning at the Robins Plant of Todd Shipyards Corporation in four-

(Page 413, Please)



U. S. S. aircraft carrier Enterprise, prior to launching at the yard of the Newport News Shipbuilding and Dry Dock Company, showing part of the fore poppet erection on the launching ways.

Building in American Yards



Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Completion date 9/19/37, **Hull 5356—Maury (DD401)**; completion date 12/19/37; two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $2,675,000.

Hull 5359, Pacific; seagoing hopper dredge for U. S. Engineers; completion date, April 2, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Point Bonita, Malolo, Santa Elena, Durango, Antigua, Dredge Culebra, Lansing, Charles ,R. McCormick, Chas. L. Wheeler, Jr., Haviside Barge No. 4, U. S. Dredge Multnomah, Mariposa, H. M. Storey, Chiriqui, Paul H. Harwood, U.S. Dredge San Pablo, Golden Sun, Frank H. Buck, Pacific, Mericos H. Whittier, Talamanca, Pres. Pierce, W. S. Miller, Makura, M.S. Asia, West Camargo, Florence Luckenbach.**

THE CAMPBELL MACHINE COMPANY

Foot of Eighth Street
San Diego, California

NEW CONSTRUCTION: **Hull 49, Belle of Portugal, tuna clipper**; Lawrence Oliver & Co., owners. Length 130′; main engine 550 h.p. 6 cylinder Union diesel engine. Launched September 19, 1936; completion date, January 1, 1937.

Hull 50, Picaroto, tuna clipper; Lawrence Oliver, Rosa Bros. & Co., owners; sister ship of Belle of Portugal. **Launched October 15, 1936**; completion date, January 1, 1937

Hull 51, Golden Gate, tuna clipper; Paul Zanetta, Frank Zalinski, Lawrence Canepa, owners. Length 75′, main engine 190 h.p. 6 cylinder Union diesel. Launched July 18, 1936; **completion date November 1, 1936.**

Hull 52, Benita, tuna clipper; Matt Ghio, owner. Length 86′, main engine 225 h.p. 6 cylinder Union diesel. Launched September 26, 1936; **completion date, November 15, 1936.**

Hull 53, Victoria, tuna clipper; Mathew C. Monise, owner. Length 135′, main engine 600 h.p. 6 cylinder Union diesel. **Launching date, November 1, 1936**; completion date, March 1, 1937.

Hull 54, Triunfo, tuna clipper; Joaquim Canas & Co., owners. Length 125′, main engine 450 h.p. 6 cylinder Union diesel. **Launching date, November 10, 1936**; completion date, March 1, 1937.

DRYDOCK AND ROUTINE REPAIRS: **San Salvador, Cabrillo, City of San Diego, California, Defender, Sea Boy.**

FELLOWS AND STEWART, INC.

Wilmington, Calif.

NEW CONSTRUCTION: **4 keels laid** July 6, 1936, Fellows Craft stock cruisers 30′ x 8′ x 2′6″, powered with Kermath Sea Flyer 6-cylinder 85-H.P. engines with 2 to 1 reduction gears.

GENERAL ENGINEERING AND DRYDOCK CO.

Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Tug Phoenix, Gas. S. Adventuress, S.S. Makua, Derrick Barge, Barge S.O. Co. No. 11, Gas. S. Surf, Mana, Gas. S. St. Mary, Ferry City of Seattle, U. S. Cutter Tahoe, Ship Star of Shetland, Ferry Golden West, Tug Sea Salvor, S.S. West Planter, Dredge Golden Gate,Castle Town, Lumberman, Tug Gov. Irwin.**

HARBOR BOAT BUILDING CO.

Berth 264—Fish Harbor
Terminal Island, Calif.

NEW CONSTRUCTION: **Four 80′ U. S. Coast Guard patrol boats**; 1,600 H.P. each; Liberty-Vimalert conversions; speed 30 m.p.h. Keels laids September, 1936; estimated launching, March, 1937; expected completion, July, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Purse seine fishing boats Fairyland, Satrania, Congar, Bremen, Diesel salvage tug Retriever.**

HONOLULU IRON WORKS

Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Empress of Canada, President Monroe, President Garfield, Ship Star of Lapland, Yacht Zaca.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.

Los Angeles Harbor
San Pedro, Calif.

DRYDOCK, PAINT, MISCELLANEOUS: **Golden Sun, Golden Dragon, Tug Capt. William, Tug Listo, M.V. Capella, Mojave, Rossington Court, Tug D. M. Renton, G/B Princess, Golden Horn, Brandywine, Catalina, Deroche, W. R. Chamberlin, Jr.**

THE MOORE DRY DOCK CO.

Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Hidalgo, El Aquario, Willsolo, R. M. Woodward, Golden West, American Oriole, Polarine, Sobre Los Olas, Hawaiian, American Star, Water Barge YW30, Stuart Dollar, Mt. Baker, Embassae, Seattle, Cutter Shoshone, Arizonan, Dredge Golden Gate, Alfios, Wm. A. McKenny, Oregon, Californian, Derrick Barge No. Two, Margaret Johnson, Margaret Dollar, Modavia, Balboa, Brazil, Dist. of Columbia, El Commodore, Frances, Lockgoil, Golden Horn, Patterson, Clipper, Diana Dollar.**

PRINCE RUPERT DRYDOCK AND SHIPYARD

Prince Rupert, B.C.

DRYDOCK AND ROUTINE REPAIRS: Two scows; 3 fishing boats; 16 ship repair jobs not requiring docking; 23 commercial jobs.

THE PUGET SOUND NAVY YARD

Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Patterson** (Destroyer No. 392); standard displacement, 1500 tons; keel laid July 23, 1935; estimated completion date, February 1, 1937.

U.S.S. Jarvis (Destroyer No. 393); standard displacement, 1500 tons; keel laid August 21, 1935, estimated completion date, May 1, 1937.

Construction of **Destroyer No. 408, U.S.S. Wilson**, 1500 tons, keel not yet laid.

DRYDOCK AND ROUTINE REPAIRS: **California, West Virginia, Col-**

orado, Texas, Ranger, Saratoga, Salt Lake City, Swallow, Mahopac, Tatnuck, Challenge, Wando, Aroostook, Jason, Kearsarge (Crane Ship), Patoka, Pawtucket, Prometheus, Pyro.

STEPHENS BROS. BOATYARD

Stockton, Calif.

NEW CONSTRUCTION: **Folderol,** 48′ cruiser, teakwood hull, equipped with Scripps 164-165 motors, for Marshall Dill, San Francisco; **launched October 4, 1936.**

Keel laying begun for ten 36′ and ten 29′ stock keels.

TODD SEATTLE DRY DOCKS, INC.

Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **Jason, Stuart Dollar, West Cactus, Peter Helms, Charcas, Tug Active.**

UNITED STATES NAVY YARD

Mare Island, Calif.

NEW CONSTRUCTION: **Smith,** Destroyer (DD378): standard displacement, 1500 tons; keel laid October 27, 1934; launched February 20, 1936.

Preston, Destroyer (DD379); standard displacement, 1500 tons; keel laid, October 27, 1934, launched April 22, 1936.

Henley, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935; to be launched early in 1937.

Pompano, Submarine (SS181); estimated delivery August, 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); building period started December 1, 1935; completion date, June 1, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Tern, Robin, Dallas, Southard, Chandler, Hovey, Long, Sonoma, San Francisco, Tuscaloosa, Wright, U.S.C.G. Shoshone.**

WESTERN BOAT BUILDING CO.

Tacoma, Wash.

NEW CONSTRUCTION: **Keel No. 120,** Purse Seine Fishing boat. 87′ long, 23′ beam. 240 H.P. Atlas Imperial engine. Keel laid September 15; estimated launching, December 1, 1936; completion date, January 1, 1937. No owner as yet.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Pennsylvania

NEW CONSTRUCTION: **14** coal barges 195′x35′x11′; 6 launched; **8** dump scows 114′x26′x7′9″; **20** coal barges 175′x26′x11′.

THE AMERICAN SHIP BUILDING COMPANY

Cleveland, Ohio

NEW CONSTRUCTION: **Contract for dredge hull** to be built at Buffalo plant.

BATH IRON WORKS

Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis** and **DD396 Jouett**; Three 1850-ton destroyers for U.S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively, **DD396,** keel laid, Mar. 26, 1936. **DD395,** keel laid July 28, 1936. **DD394,** keel laid April 8, 1936.

Hulls Nos. 165 and 166, trawlers, single screw, steel, diesel propelled, for Boston, Mass., owners; 165 launched September 19, 1936.

Hull No. 167, Ferryboat Aquidneck. Diesel electric ferry for U.S. Navy; estimated delivery, March, 1937.

Hull No. 168, Trawler, single screw, steel, diesel propelled, for delivery to Boston, Mass., owners, during December, 1936.

Hull No. 169, Trawler, single screw, diesel propelled, for delivery to Boston, Mass., owners in April, 1937.

BETHLEHEM SHIPBUILDING CORPORATION

Fore River Plant,

Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA44, Vincennes,** 10,000 tons. Keel laid January 2, 1934; launched May 21, 1936; estimated delivery, January, 1937.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; **estimated launching, November, 1936;** estimated delivery, March, 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, June, 1937.

CV7, Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated delivery, September, 1938.

Hull 1463, U. S. Army Hopper Dredge Goethals; 5000 cubic yards capacity; estimated delivery February 1, 1938.

BETHLEHEM SHIPBUILDING CORPORATION

Sparrows Point Plant

Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers—steam—**425′x64′x34′ for Gulf Refining Co.; total tonnage 7070 each.

IRA S. BUSHEY & SONS, INC.

Foot of Court Street

Brooklyn, New York

NEW CONSTRUCTION: **Two 76′ all-welded diesel towboats** of 450 horsepower each.

One 90′ all-welded diesel towboat of 750 horsepower.

DRYDOCK AND ROUTINE REPAIRS: **Port Jefferson, Pilot Boat Sandy Hook, Tug Jos. Carroll, Diesel Tugs Central, Calatco, and Cayuga.** Cutting tanker **J. A. Cummings** in half and adding 20 feet in length.

CHARLESTON SHIPBUILDING & DRYDOCK CO.

Charleston, S.C.

NEW CONSTRUCTION: One 65′ all welded steel diesel tug for the Krajewski-Pesant Mfg. Co., New York.

DRYDOCK AND ROUTINE REPAIRS: **Tug Waban, tug R. H. Lockwood, U.S. Lightship No. 109, Tug James H. Clark, yacht Sally Ann, yacht Panther, U.S. Quartermaster steamer Sprigg Carroll.**

CONSOLIDATED SHIPBUILDING CORP.

Morris Heights, New York City

NEW CONSTRUCTION: **65-footer** for E. E. Dickinson, powered with 2 Speedways, **42-footer** for A. P. Green, powered with 2 110-H.P. Kermaths.

Four 39-foot "play boats" for stock **34-foot Florida guide-boat,** powered with 2 Grays.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

NEW CONSTRUCTION: **One 175′x34′x10′ tender** for U.S. Lighthouse Dept. Two triple expansion steam engines; total horsepower 1000; keel laid July 1, 1936; estimated delivery, February 1, 1937.

One fire boat for City of Chicago, 90′ 6″ long, 22′4″ beam; diesel power; pumping capacity, 7,500 gallons per minute at 150 pounds; delivery January 1, 1937.

THE DRAVO CONTRACTING CO.

Engineering Works Dept.,

Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hull No. 1266, one steel 20″ pipe line dredge for U. S. Engineer Office, St. Paul, Minn., of 1987 gross tons.

Hulls Nos. 1292-1295 inclusive; 4 welded flush deck cargo box barges 130′ x 30′ x 7′6″; 1000 gross tons.

Hull No. 1296, one welded cattle barge 196′ x 36′6″ x 8′ for Jersey City Stockyards; 1300 gross tons.

Hull No. 1297, one welded oil barge 110′ x 20′ x 11′ for Patterson Oil Terminals, Inc., Philadelphia, Pa.; 335 gross tons.

Hulls Nos. 1298-1299, inclusive; two self-propelled diesel pipe line dredges, Thompson and Rock Island, for U.S. Engineers, St. Paul; 3974 gross tons.

Hulls Nos. 1305-1309, inclusive; five welded type W-3 coal barges, 175′ x 26′ x 10′8″; 2360 gross tons.

Hull 1310, one welded steel coal barge, 134′ x 34′ x 16′, of 362 gross tons.

Hulls 1311-1313, inclusive; three riveted sand and gravel barges 100′ x 26′ x 6′6″, for Smoot Sand and Gravel Corp., Washington, D. C.,; 495 gross tons.

Hulls Nos. 1314-1323, inclusive; ten welded type W-3 coal barges 175′ x 26′ x 10′8″ for stock, 4720 gross tons.

Hulls Nos. 1324-1327, inclusive; four welded flush deck cargo box barges 100′ x 26′ x 6′6″; 660 gross tons.

Hulls Nos. 1328-1337, inclusive; ten welded type W-3 coal barges 175′ x 26′ x 10′8″ for stock: 4720 gross tons.

This makes a total of 43 hulls under contract, with a total gross tonnage of 22,004.

ELECTRIC BOAT CO.

Groton, Conn.

NEW CONSTRUCTION: **Hull No. 23, Perch,** S.S. 176, building for U.S. Navy; keel laid, February 25, 1935; launched May 9, 1936; estimated completion date, December, 1936.

Hull No. 24, Pickerel, S.S. 177 keel laid March 25, 1935; launched July 7, 1936; estimated completion date, February, 1937.

Hull No. 25, Permit, S.S. 178, keel laid June 6, 1935; **launched October 5, 1936.**

Hull No. 26, Salmon, SS182, standard displacement 1450 tons; keel laid April 15, 1936.

Hull No. 27, Seal, SS183, standard displacement, 1450 tons; keel laid May 25, 1936.

Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; keel laid July 22, 1936.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY

Kearny, N. J.

NEW CONSTRUCTION: **DD369 Reid,** destroyer for U. S. Navy; nearing completion.

Two destroyers, **DD381 Somers** and **DD383 Warrington;** keels laid June 27, 1935 and October 10, 1935, respectively; **estimated launching, November, 1936** and January, 1937, respectively; estimated completion March 1, 1937.

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938; keel laid, DD397, September 1, 1936.

Two 12,800 ton tankers, for the Pan American Petroleum and Transport Company, keels laid February 17, 1936 and March 17, 1936; **estimated completion dates October 1936** and December 1936, **respectively.**

Four 12,800-ton tankers for the Standard Oil Company of New Jersey; Isherwood Arcform design of hull form and longitudinal hull framing.

THE INGALLS IRON WORKS COMPANY

Birmingham, Ala.

NEW CONSTRUCTION: **Three oil barges** 125′ x 30′ x 7′; **three oil barges** 150′ x 30′ x 7′; for International Petroleum Co., Ltd. (Tropical Oil Co.) Toronto, Ontario; **estimated launching, September 19, 24, and 29, and October 17, 22, and 27, 1936; estimated completion, November 5, 1936.**

JAKOBSON & PETERSON, INC.

Ft. of 16th Avenue

Brooklyn, New York

NEW CONSTRUCTION: **One 88′ all welded steel tow boat** for Dauntless Towing Line of N.Y. To be powered with 650 H.P. Cooper Bessemer diesel engine. **Launched October 21, 1936; completion date, November 14, 1936.**

One 65′ all welded steel combination tow boat and tanker for the Lewis Coal & Oil Corp. of Port Washington, N.Y. To be powered with 300-H.P. Atlas Imperial diesel engine. **Launching date, November 18, 1936;** completion date, December 23, 1936.

LEVINGSTON SHIPBUILDING CO.

Orange, Texas

NEW CONSTRUCTION: **One full model hull, all-welded diesel tug,** 55′ long, 14′ beam, 7′6″ deep; 120-horsepower Fairbanks-Morse marine diesel engine; for Atlantic, Gulf & Pacific Co., New York City.

One all-welded, steel derrick barge 50′ x 28′ x 5′3″, for Austin Bridge Co., Dallas, Texas.

One all-welded, steel ferryboat, length overall, 149′, beam over guards, 66′, beam molded, 54′, depth molded, 11′. Twin screw diesel electric. Two 350-horsepower Cooper-Bessemer diesel engines with Westinghouse generators and motors. For Algiers Public Service Corp., New Orleans, Louisiana.

DRYDOCK AND ROUTINE REPAIRS: **Lighthouse tender Larkspur,** installation of new boilers and general overhauling; cost $50,173.50.

MANITOWOC SHIPBUILDING CO.

Manitowoc, Wis.

NEW CONSTRUCTION: **One steel dump scow and one steel dry dock section** for Great Lakes Dredge and Dock Co., Chicago, Ill.

One steel dump scow for Fitzsimons and Connell Dredge and Dock Co., Chicago, Illinois.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, West Virginia

NEW CONSTRUCTION: **One sternwheel river steamer,** 200′ x 44′ x 5′6″; keel laid October 25, 1936.

Ten standard river coal barges, 175′ x 26′ x 11′; **completion dates, October and November, 1936.**

MARYLAND DRYDOCK CO.

Baltimore, Maryland

NEW CONSTRUCTION: **Three steel covered lighters,** 120′ x 30′ x 8′, for the Merchants & Miners Transportation Company.

One steel, double ended, diesel electric ferryboat, for Norfolk, Va.

DRYDOCK AND ROUTINE REPAIRS: **Thomas P. Beal, Plymouth, Elizabeth and Hilton. Catherine** being completely reconditioned, and new fireproof passenger quarters and public spaces being constructed.

THE NEW YORK SHIPBUILDING CORPORATION

Camden, N. J.

NEW CONSTRUCTION: Contract for three destroyers: **Hull No. 408, Porter (DD356),** launched Dec. 12, 1935; **Hull No. 409, Selfridge (DD357),** launched April 18, 1936; **Hull No. 411, Winslow (DD-359);** of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashville (CL43), and Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935;

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.

90 Broad Street, New York

NEW CONSTRUCTION: **H 359 aircraft carrier CV5, Yorktown, for U. S.** Navy; keel laid May 21, 1934; launched April 4, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; **launched October 3, 1936.**

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; estimated launching, December 3, 1936.

H362, light cruiser CL49, St. Louis; estimated keel laying, December 14, 1936.

THE PUSEY & JONES CORP.

Wilmington, Del.

NEW CONSTRUCTION: **Hulls Nos. 1064 and 1066—two steel hull towboats** building for Donaldson Towing & Lightering Co., Phila., dimensions: 95′ L.O.A. 88′ L.B.P. x 24′ x 14′ 9″; one Unaflow vertical marine type engine, two cylinders 25″ dia. x 20″ stroke, 130 R.P.M. 600 I.H.P. One Scotch type boiler 13′ 3″ diam. x 11′ 6″ long, 3 furnaces, 185 lbs. W.P. **Estimated delivery, November, 1936** and February, 1937, respectively.

SPEDDEN SHIPBUILDING CO.

Baltimore, Md.

NEW CONSTRUCTION: **One 60-foot iron hull,** all-welded V bottom boarding and fumigating vessel for U. S. Public Health Service; equipped with twin screw Superior diesel engines. **Keel laid November, 1936;** launching date, February 1, 1937; delivery date, March 23, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Consolidated Gas & Electric Light Power Co. scow; steel tug Baltimore; tug Parker; pilot boat Morgeaud; tug M. Mitchell Davis; tug Isos; tug Columbia; tug A. A. Denhard.**

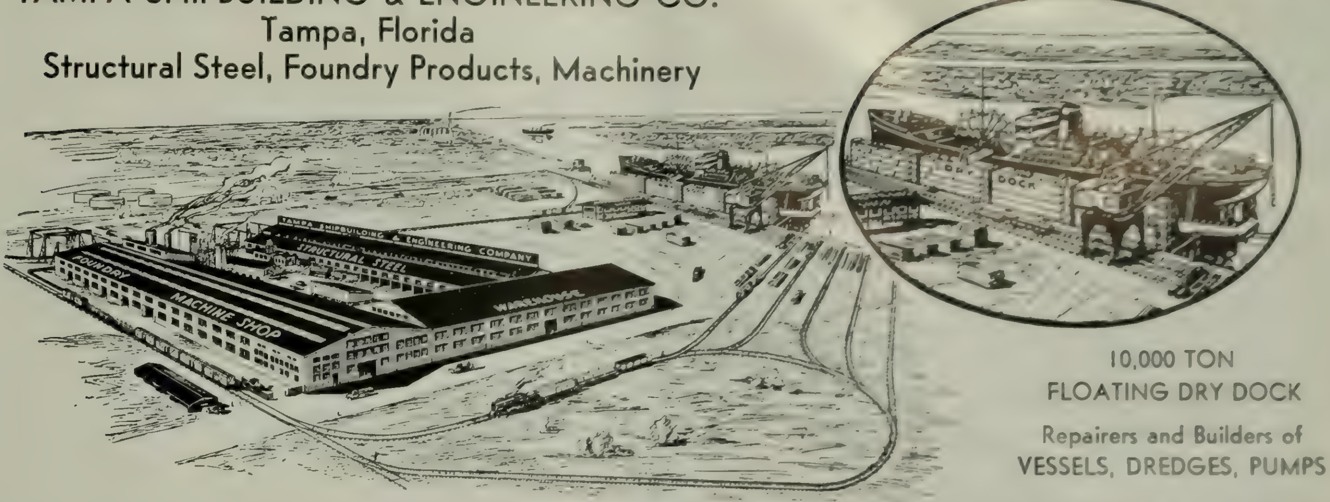
SUN SHIPBUILDING AND DRYDOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION: **Hull No. 156.** One single screw bulk oil tanker for the Pan American Petroleum Corporation and

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485′6″x68′0″x37′0″; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 156. Keel laying March 16, 1936; **launching October 31, 1936; delivery November 20, 1936.** Estimated dates for Hull No. 157. Keel laying April 15, 1936; **launching Nov.**

TAMPA SHIPBUILDING & ENGINEERING CO.
Tampa, Florida
Structural Steel, Foundry Products, Machinery



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FLOATING DRY DOCK

Repairers and Builders of
VESSELS, DREDGES, PUMPS

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TAMPA BAY FREE FROM EXCESSIVE STORMS, A GOOD PLACE FOR YACHTS TO LAY OVER SUMMER AND WINTER.

28, 1936; delivery Dec. 14, 1936. Estimated dates for Hull No. 158. Keel laying May 8, 1936; launching Dec. 12, 1936; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511'x65'9"x37'; 15,800 tons.

Hull No. 160, 1 oil tanker (steam) 520'x70'x40' for Atlantic Refining Co.; 18,500 tons.

Hulls No. 161 and 162, steam tankers for Standard Oil Company of New Jersey; 422' x 65' x 35'; 12,900 dwt.

Hulls No. 163 and 164, diesel tankers for The Texas Company; 465' x 65' x 34'6"; 12,000 dwt.; keel laying, December 1, 1936 and December 15, 1936, respectively.

TREADWELL CONSTRUCTION COMPANY
Midland and Erie, Pa.

NEW CONSTRUCTION: **1 steel gold dredge** (ladder type) **hull** 155'x70'x13' for South American firm.

Four barges 100' x 26' x 6'6" for Pittsburgh Gravel Co.

Two dump scows 93' x 22' x 8'10" for U. S. Engineer, Cincinnati, Ohio.

24 pontoons 48' x 16' x 2'6" for U. S. Engineer, St. Paul, Minn.

UNITED SHIPYARDS, Inc.
Staten Island, N.Y.

NEW CONSTRUCTION:

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched April 18, 1936; estimated delivery, December 9, 1936.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched September 18, 1936; estimated delivery, February 9, 1937.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267' overall, 66' extreme breadth, 19'9" depth; keels laid April 4, April 27, and May 1, 1936, respectively; **estimated launching, November 17,** December 8, and December 29, 1936, respectively; estimated delivery, January 19, Feb. 9, and March 2, 1937, respectively.

UNITED STATES NAVY YARD
Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn,** light cruiser, L.B.P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; **estimated launching, November 30, 1936;** estimated delivery, November 1, 1937.

CL 48, **Honolulu,** light cruiser; L.B.P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching indefinite; estimated delivery, May 1, 1938.

CL 50, **Helena,** light cruiser; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers; keel laying, December, 1936; launching indefinite; contract delivery, May 16, 1939.

CG 69 and CG 70, **Alexander Hamilton** and **John C. Spencer,** cruising cutters for U.S.C.G. service; L.B.P. 308'; beam 41'; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated launching December 1936; estimated delivery, February 1, 1937, and March 1, 1937, respectively.

DRYDOCK AND ROUTINE REPAIRS: **U.S.S. New Orleans** scheduled for overhaul from September 1 to November 27. **U.S.S. Mahan** and **U.S.S. Flusser,** arrived at yard on September 17 and 19, 1936, respectively, for outfitting.

UNITED STATES NAVY YARD
Charleston, S.C.

NEW CONSTRUCTION: **One Coast Guard Cutter** (2000 tons). Keel laid August 15, 1935; estimated launching, January 14, 1937; estimated completion, April 15, 1937.

Order placed for **DD407,** 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD
Portsmouth, N. H.

NEW CONSTRUCTION: **SS179 Plunger,** keel laid July 17, 1935; L.B.P. 292'6", beam 25', loaded draft 15'; launched July 8, 1936; estimated delivery Feb., 1937; **SS180 Pollack,** keel laid October 1, 1935; L.B.P. 292'6", beam 25', loaded draft 15'; launched September 15, 1936; estimated delivery May, 1937.

SS185 Snapper, submarine; keel laid July 23, 1936; L.B.P. 300', beam 26', loaded draft 15'7"; date of completion March 1, 1938; **SS186 Stingray,** submarine; keel laid October 1, 1936; L.B.P. 300', beam 26', loaded draft 15'7"; date of completion June 1, 1938.

Latest News from American Shipyards

(Continued from Page 409)

teen days, at the end of which time she was at her pier ready to sail for South America.

Reconditioning included a new swimming pool, equipping the dining room with an air conditioning system, dry docking, cleaning, painting, and various other overhauling work. Her shade deck had been extended 28 feet for the full width of the ship, and a complete steel deck installed, including beams, plating, girders and coaming, covered with calked wood decking with necessary rails, ladders, etc., built in.

Pioneer Rope Firm Enters Coast Market

—Photo, Barboni Studio.

Warren Taylor, who heads Wall Sales Service on the Coast.

The one hundred and six year old Wall Rope Works, Inc., with the fine reputation they have developed and maintained for over a century on the Atlantic seaboard have recently established coast selling connections under the Pacific Coast management of Warren Taylor.

For ten years, Mr. Taylor has been identified with cordage sales in this territory, principally in the marine field. He resigned his last position on August 15th to build up the new sales coverage for Walls cordage and sisal products. Already sales outlets have been established in principal Pacific maritime districts with headquarters at Gilmore Steel and Supply Company, 821 Folsom St., San Francisco.

The Gilmore organization handles a varied line of engineers' and marine supplies. Three warehouses are operated so that cordage stocks will be complete. The Gilmore firm, headed by W. G. Gilmore and his brother, M. C. Gilmore, has enjoyed a rapid expansion during the past few years. Familiarly known as "Bill" and "Mac" these officials are highly regarded in the industry, where they have become more and more active in marine channels with the various classifications of users of sea-going cordage. Warren Taylor conducts his head office at the Gilmore location. William Dowdall has the San Francisco waterfront as his special selling area.

The Beebe Company are Wall's sales agents in Portland and Astoria. In Seattle, Nordby Supply Company as well as Campbell Hardware and Supply Company are the merchandising outlets.

In an interview with Warren Taylor we learned that Wall Rope Works, Inc., operate the longest rope walk in the world—at Beverley, New Jersey. Head offices are at 48 South Street in New York.

"Walk-laid" cordage is manufactured as large as twenty-six inches in circumference.

Tarred-hemp rope, twines, and marine cordage in a range of sizes are stocked in the newly established Coast selling offices.

Progress of Construction

UNITED STATES NAVY YARD
Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case**, L.B.P. 334′; beam 35′; depth 19′8″; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, December, 1936.

Destroyer DD371, Conyngham, L.B.P. 334′; beam 35′; keel laid Sept. 19, 1934; launched Sept. 14, 1935; estimated delivery, January, 1937.

DD389, Mugford, and DD390, Ralph Talbot, two light destroyers; LBP 334′; beam 35′6″; depth 19′8″; keels laid October 28, 1935; **launched October 31, 1936**; estimated delivery, April, 1937 and July, 1937, respectively.

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334′; beam 35′6″; depth 19′8″; estimated delivery, June and August, 1938.

Order placed for **DD415** and **DD416**, two destroyers; no dates set.

UNITED STATES NAVY YARD
Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia**, L.B.P. 600′0″; beam 61′,7¾″; molded depth at side to main deck amidships 42′0¾″; draft corresponding to normal displacement 21′,8½″; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

Coast Guard Cutter No. 67, William J. Duane; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated date of keel laying April, 1935; estimated date of completion, November, 1936.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308′, beam 41′, depth molded at side to main deck amidships 23′6″, draft corresponding to normal displacement 12′6″, standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61′ 9¾″, depth molded at side to main deck amidships 42′0 3/8″, draft corresponding to normal displacement 21′10″; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404**, 1500 ton destroyer; no dates set.

News from American Shipyards

Shoal Draft Wheat and Oil Carrier Building for Seattle Company

Construction of a steel, tunnel stern, light draft wheat carrier and tanker combined is being carried out by the Western Engineering Company, Seattle, for the Inland Navigation Company, Seattle, Washington. G. Kobrow, McDowell Building, Seattle, naval architect, is supervising the work. The ship will have a length of 190 feet, beam of 38 feet, and loaded draft of 6 feet; two 650 horsepower direct connected diesel engines will furnish the power.

Observations *From The* Crow's Nest

"NAMES AND NEWS" ★ BERNARD De ROCHIE, LOOK-OUT MAN

● Jack Young

Bound for Washington, D.C., a recent arrival here was **John A. Young,** manager of the Young Brothers Tow Boat Company of Honolulu, which operates the largest diesel powered tug in the world. Operations of the firm's business, according to Young, are being hampered by recent federal regulations, which are applied to no other operators on the Coast, owing to the size of the Honolulu organization. Young Brothers does all the hauling of pineapples from Molokai and Lanai to Honolulu.

● New Canal Service

The San Francisco French Line Offices, through **Gilbert Macqueron,** French Line Pacific Coast representative, recently called to Paris for a conference with executives of the line, announces the addition beginning May 1937 of a fast luxury liner to the present Pacific Coast fleet.

The Bretagne will sail from San Francisco on May 12; from Los Angeles on May 15, and is due in Europe on June 12, after calling in Central America and the Panama Canal. Ports of call in Europe will include Plymouth (England) and Havre (France).

The Bretagne is a fast, luxurious liner of 14,730 tons displacement, 8984 tons gross, 450 feet long, fitted with "de luxe" public rooms, extensive lounges, a lovely dining room, reading rooms, children's quarters, and a "cafe terrasse" overlooking the built-in swimming pool.

The 17 knot turbine-liner Bretagne now being entirely renovated in Le Havre and fitted for tropical service, previously intended for the West Indies Mail Line, will be diverted from that service and sent out to the Pacific via Panama and Central America.

Three of a Kind, in Scots

For those doubting souls who think Scots are fit only for such positions as presidents of banks and steel companies, prime ministers of nations, builders of railways and empires, leaders of St. Andrews and Caledonian societies, virtuosos of the pipes, and chief engineers of steamers, here is a trio of Scots who have made good in a different direction—as executive officers of the Canadian Pacific liner Empress of Canada. They are, left to right: Chief Officer Donald Smith, Capt. J. F. Patrick, commander; and Staff Captain J. Bisset Smith (no relative of Donald Smith but a brother of Sydney Smith, Vancouver's noted sea captain-barrister). Each was born in the land of heather, Donald Smith at Stornoway in the bleak Hebrides; Capt. Patrick at Glasgow; and Staff Captain Bisset Smith in scenic Banffshire. Captain Patrick is an old timer on the Pacific, while the two Smiths came to the Pacific fleet of Empresses in 1919, following war service that climaxed many years of sailing on the Atlantic and to all parts of the world out of British ports.

Lloyd's San Francisco agent, **Captain Walter Gay,** has returned after a six-months' trip to Europe. The captain is also Pacific Coast representative for Andrew, Weir & Co. **Captain T. H. Morgan,** representing Lloyd's during Captain Gay's absence, is returning to London to take over a new assignment.

Propeller Club of California Observes Navy Day

Emphasizing the interdependability of the United States Navy and the American Merchant Marine, the Tuesday, October 27, meeting of the Propeller Club of California was dedicated to the observance of Navy Day, marking the high light of the day's activities in the San Francisco district.

Presiding was Joseph J. Geary, helmsman of the Propellers. Walter J. Walsh was chairman of the day, introducing honored guests including: Dr. Geiger, representing Mayor Rossi; Admiral C. P. Snyder, ranking naval officer in the city; Captain Joseph N. Ogan; Lieutenant Colonel Harry Schmidt of the marines; Captain C. C. McMillam of the coast guard; Captain H. J. Abbett; and Commodore George W. Bauer.

Speaker Byington lauds Navy record while President Geary lends an approving ear.

Guest speaker was Lewis F. Byington, delivering a masterly talk praising the spirit of our navy and tracing the development of the San Francisco Bay area from the first days of Spanish and English exploration.

Speaker Byington paid tribute to Theodore Roosevelt, whose birthday is honored by the annual Navy Day celebration.

"All presidents from the immortal 'T. R.' down to the present administration have declared for a larger navy," he stated. "Courage, honor, opportunity and heroism symbolize the flag. We need today the principles of patriotism, for which the navy stands. We only want people in this country who owe allegiance to the Star Spangled Banner."

The Propeller Club of California shared the sponsorship of the event with the Navy League, the C. C. Thomas Post of the Legion, and the Naval Officers Reserve Association.

The Tuesday, October 13 meeting was attended by a fine turn-out of members, who came away enthusiastic over the program. A motion-picture film with sound was projected, showing the history of the manufacturing of petroleum products on the West Coast. Sponsored by the Standard Oil Company of California, the California scenes depicting the production and transportation of crude oil and its refined products were particularly interesting.

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Secretary-Treasurer
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320 Market Street, Room 249,
San Francisco
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FLETCHER MONSON

● Our Next Meeting

November 10 we'll be back at our old quarters in the Red Room at the Fairmont, after moving for the big Navy Day celebration to the main dining room.

Through the courtesy of Columbia Steel Company we are to witness their very timely film, which describes the building of the San Francisco-Oakland Bay Bridge. Columbia Steel's cable-spinning and superstructure work will be delineated. Those who have been privileged to "preview" the film after its return from Hollywood studios, where it was "sound-edited" and captioned, report it one of the best. Particularly timely, too—as the new bridge will be opened for automotive traffic two days after our program!

● New Members

Stanley E. Allen, our secretary-treasurer, reports the acceptance of the following new Propellers:

James R. Anderson
William M. Loughton
T. C. Patterson
Harry S. Scott

Ahoy, mates! Hope to see you aboard at every meeting!

In Memoriam

Capt. F. K. Dedrick

President, California Whaling Company.

Albert F. Zipf

Vice-president and general manager of Williams Steamship Corp. San Francisco district manager of American-Hawaiian Steamship.

J. E. Gooderidge, for the past six years special sales representative, Union Oil Company, has been appointed as assistant to Director of Sales, **V. H. Kelly,** according to a company announcement.

Gooderidge was first employed as special sales representative July 1, 1930, and has since devoted his time to the sale and service of company products to contractors on major construction projects throughout the Western portion of the United States. In his new position he will continue the supervision of this and other work in furthering the sale of both refined and lubricating oil commodities.

A native of England, Gooderidge came to the United States in 1920, and after a unique tour which took him into practically every state in the Union, during which he regained the health which had been shattered in five years of service with the Royal Air Force, established himself in the automobile insurance business in Los Angeles in 1922. He was identified as sales executive in building one of the largest automobile insurance enterprises in the United States, and it was while affiliated with the insurance and allied businesses that he first became acquainted with Union Oil Company. His work with the company has taken him actively into such jobs as Boulder Dam, Colorado River Aqueduct, All-American Canal, Bonneville Dam, San Francisco Bridges, and other projects.

Pacific Marine Review,
500 Sansome Street,
San Francisco, California.
Gentlemen:

May I take this opportunity to thank you for your devoted services to the cause of Navy Day. The celebration throughout California was most successful, and the observance of the day in San Francisco aided greatly in stimulating enthusiasm all over the state.

Without the splendid cooperation of the members of the San Francisco Committee, it would have been impossible to have had our Navy Day celebration, and I appreciate your patriotism and participation.

With sincere thanks, I am,
Yours very truly,
Walter J. Walsh,
San Francisco Chairman for
Navy Day.

Capt. Kirkwood ("Pat") H. Donavin who recently retired from Panama Pacific post.

C. M. ("Dad") LeCount of G.E. Marine Division brings back documentary evidence of recent fishing success. His vacation pal Jim Cronin, Napa Valley orchardist, held the camera.

J. E. Gooderidge, Assistant to Director of Sales, Union Oil Company

The retirement of **Paul Nolze,** for many years manager of the North German Lloyd North Pacific service with headquarters in San Francisco, recently was announced, and will become effective on November 15. **Robert Blatt,** manager of the Seattle office for the past year and a half, and formerly manager of the Philadelphia office, has been appointed to succeed him, and **A. F. Pavenstedt,** from the Bremen office, a recent arrival on the Coast, will take over charge of the Seattle office. The arbitrary age limit set up by North German Lloyd is given as the reason for Nolze's retirement.

Harry S. Brown has been appointed permanent chairman of the Intercoastal Steamship Freight Association, according to advices recently received from New York by **Zac T. George,** Pacific Coast manager for the association, with headquarters at San Francisco. Brown was formerly chief of the division of regulation of the United States Shipping Board, whose functions have been taken over by the new United States Maritime Commission. His appointment completes the personnel of the association, and it is now functioning in perfect order.

Several changes in personnel by the American-Hawaiian Steamship Company were recently announced by **Dearborn Clark,** traffic manager, to become effective during the month of November. These changes are: **W. E. Dooling** to be assistant traffic manager, with headquarters at San Francisco; **G. V. Cooley,** district manager of the San Francisco Bay district; and **N. A. Moore,** assistant district manager of the San Francisco Bay district.

F. C. Bouman, managing director of the Holland-America Line, was a recent visitor to the Coast, first landing at Seattle, coming to San Francisco, and thence going to Los Angeles, part of his itinerary from Rotterdam, where his headquarters are located. Bouman was made managing director of the line the first of the year, and set out with the purpose of visiting the various agencies and places in the world where its ships touch.

Propeller Club Formed at Portland

Formal organization of the Port of Portland, Oregon, chapter, Propeller Club of the United States, was completed at a dinner meeting October 22, when Phillip H. Carroll, executive secretary of the Portland dock commission, was elected treasurer to fill a vacancy, and six governors were elected.

The latter were **A. B. Natland,** Alexander & Baldwin, Ltd.; **John H. Nolan,** United States local inspector of boilers; **Homer T. Shaver,** Shaver Transportation Company; **Captain Vance Trout,** operating manager of States Steamship Company; **Dan E. Gould,** assistant general freight and passenger agent, American Mail Line; and **L. R. Gault,** manager of Western Transportation Company.

November 19 was set as the date for the presentation of the club's charter by a national vice president, probably Edward Cunningham, of Seattle. Governor Charles H. Martin and Mayor Joseph K. Carson will be invited to attend.

K. C. Conyers, district manager of McCormick Steamship Company, is president; **Willis K. Clark,** secretary of States Steamship Company, is vice-president; and **Phil Thurmond,** of the Portland Chamber of Commerce, is secretary of the club.

The first annual meeting will be held during the first week of February, 1937. Intiation fee of $5.00 and annual dues of $3.00 were voted.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912

Of Pacific Marine Review, published monthly at San Francisco, California, for October 1, 1936.

State of California, County of San Francisco.

Before me Edith Goewey, Notary, in and for the State and county aforesaid, personally appeared Bernard N. DeRochie, who, having been duly sworn according to law, deposes and says that he is the Business Manager of Pacific Marine Review, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, Jas. S. Hines, 500 Sansome Street, San Francisco, California.

Editor, Alex. J. Dickie, 1035 Mariposa Avenue, Berkeley, California.

Managing Editor, None.

Business Manager, Bernard N. DeRochie, 500 Sansome St., San Francisco, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address as well as those of each individual member, must be given.) Jas. S. Hines, Owner.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Bernard N. DeRochie,
Business Mgr.

Sworn to and subscribed before me this 28th day of September, 1936.

Edith Goewey.
(My commission expires November 22, 1936)

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PACIFIC MARINE REVIEW

DECEMBER • 1936

Official Organ

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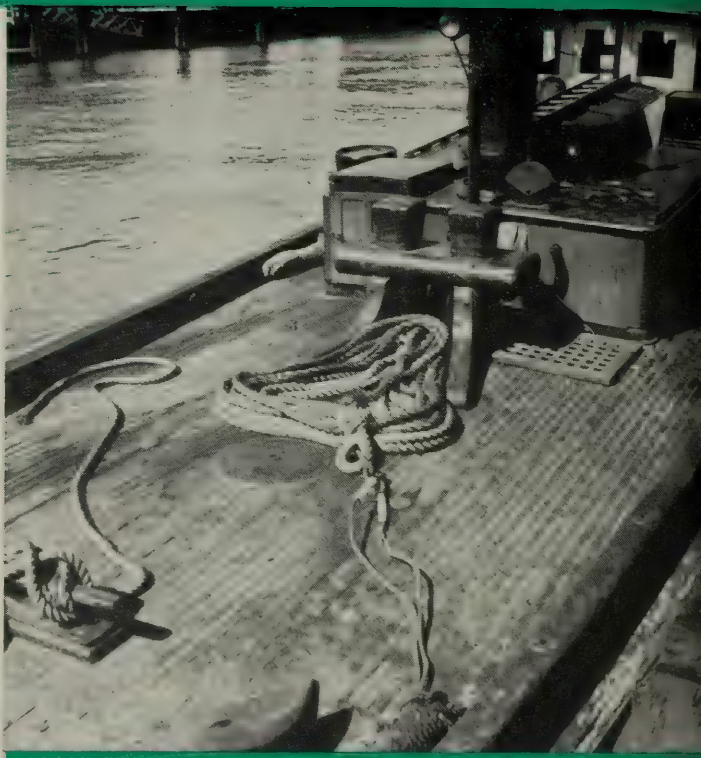

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PACIFIC MARINE REVIEW

DECEMBER, 1936
VOL. XXXIII NO. 12

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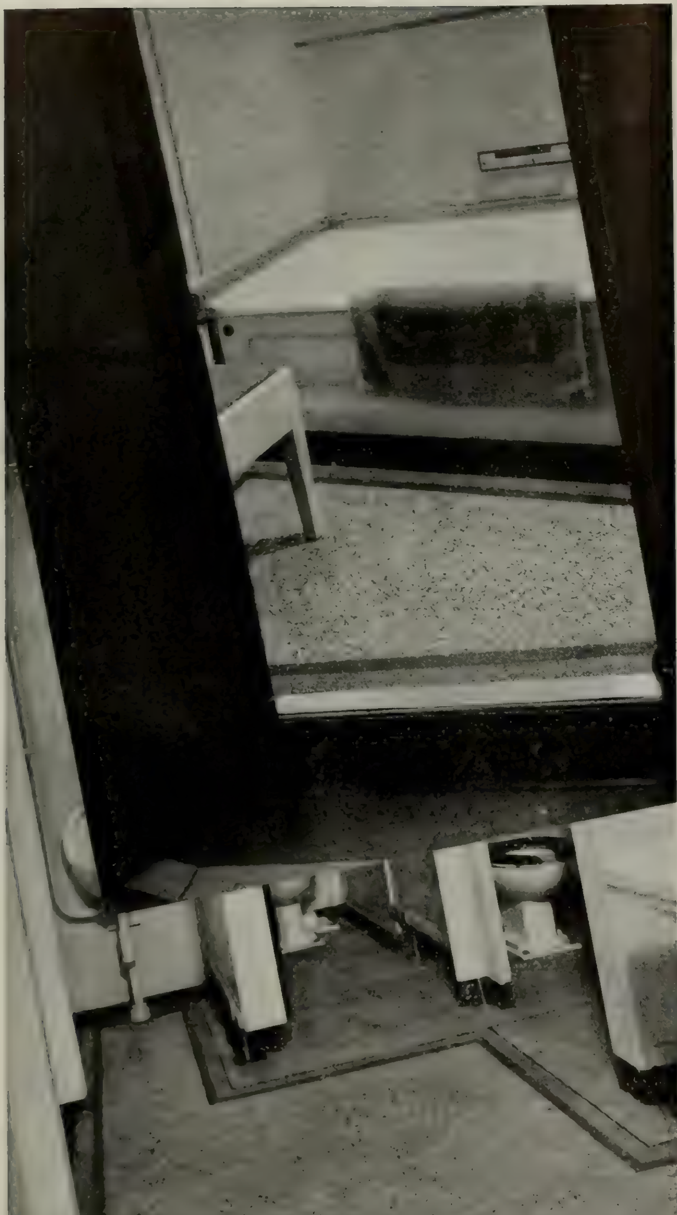

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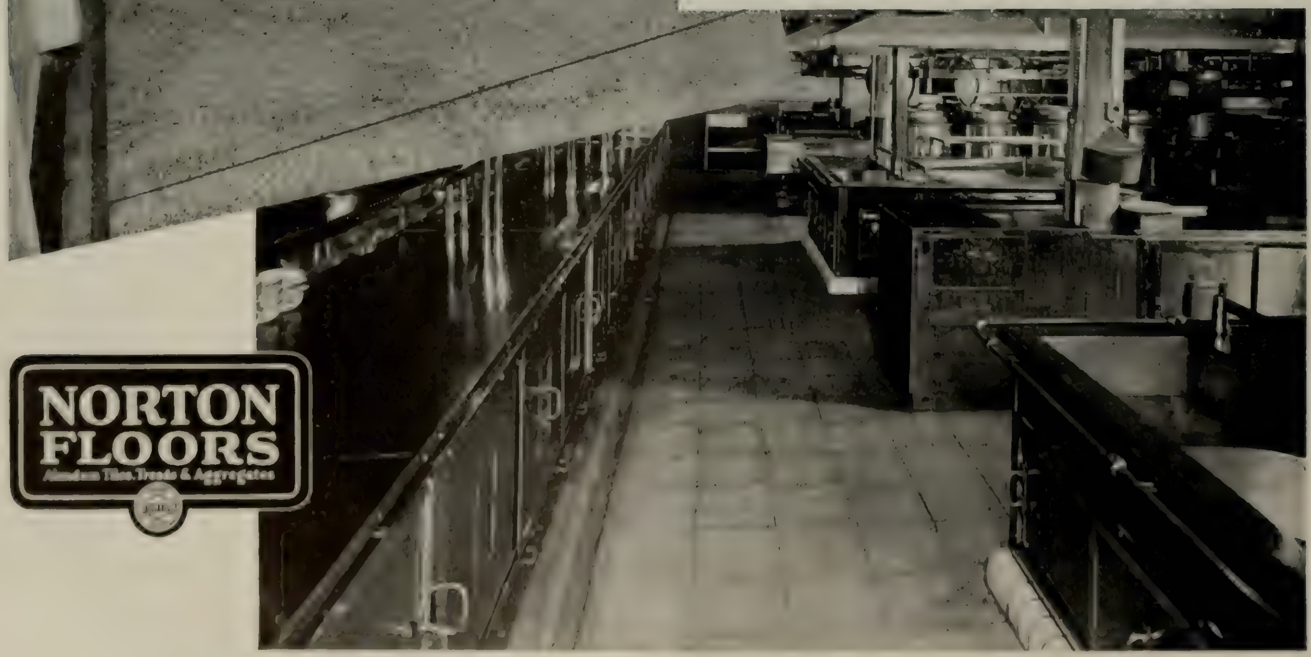

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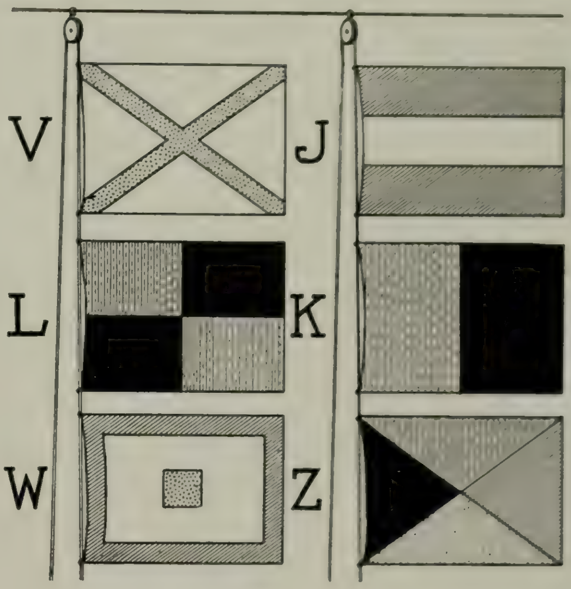


V L W J K Z

SEASON'S COMPLIMENTS

The above arrangement of international code signal flags was reproduced from the masthead of Pacific Marine Review of December, 1911. Interpreted in the light of the season, it can only mean the good old-fashioned greetings:

MERRY CHRISTMAS

HAPPY NEW YEAR

We of the editorial staff of Pacific Marine Review feel that in raising this signal this year we are expressing the earnest hope and the sincere wish of every honest man connected with American shipping that on or before December 25, 1936, these flags may be flung out from hundreds of American deep sea ships busy on their mission of carrying Christmas cheer and American good will to the ports of the seven seas.

It is still, and will be, eternally true that "Peace on Earth" is always possible to honest "Men of Good Will."

Safety at Sea

At the annual meeting of the Society of Naval Architects and Marine Engineers Rear Admiral George H. Rock, past president of the Society, during his annual "President's Address," made some very interesting remarks on Safety at Sea, which indicate that we are to have considerable legislation on that subject in the near future. Extracts from his address follow:

In the Spring of 1935, the Senate appointed a committee to investigate the Morro Castle and Mohawk disasters and the laws governing the construction and manning of ships. The investigating committee was a sub-committee of the Senate committee on commerce, under the chairmanship of Senator Royal S. Copeland. Early in its work, it became clear that our laws were neither satisfactory nor adequate, so far as the material of ships was concerned, and this investigating committee appointed a technical committee on safety at sea, of which I have the honor of being chairman, to investigate and report upon what is required to make our ships safe. This technical committee has spent seventeen months in a study of all phases of modern ship construction and has evolved a set of rules covering all these phases upon which proper legislation may be based.

The two disasters which brought about the investigation were the Morro Castle fire and the Mohawk sinking, and it is natural that the committee has given special attention to the prevention of such occurrences. Under the leadership of Mr. George G. Sharp, a completely fireproof construction has been evolved which, I believe, with experience in this type of construction will cost no more and have no more weight than present types of construction. It is only fair to say, however, that a change in technique is required just as was required when the change was made from wood to steel ships.

I look on the general subject of fire control apparatus much as I do on that of life saving equipment. Both are necessary largely because of conditions which we permit to exist. The real remedy is in the design and construction of the ship, which, if handled properly, will greatly reduce the necessity for both.

In the matter of subdivision, no such radical advance was possible, but the proposed rules are sufficiently in advance of the 1929 Convention to insure ships of the Mohawk's size and type being two-compartment ships. In the matter of stability in the damaged condition the committee, under the leadership of Mr. W. F. Gibbs, has made greater advance, and a formula is offered which will make it certain that the subdivision of the ship is not wasted.

The report of the technical committee on radio resulted in a bill being passed by the Senate, but owing to the lateness of the session this bill was not reported out of committee in the House.

Another important change adopted by the technical committee is one changing the life preservers from slab cork to expanded rubber. A number of life preservers made of the latter material are being tried out in the Navy.

The committee on personnel was appointed last spring, and is working under the chairmanship of Rear Admiral H. G. Hamlet, U. S. C. G., Retired.

The 1929 Convention finally has been ratified by our country, which is a cause for rejoicing. Much credit is due the shipowners and the shipbuilding organizations and the naval architects of the country for their unwavering support during all these years, on account of which we have the satisfaction of knowing that since the Convention was signed, even though not ratified by the United States, all of our designs have more than complied with its requirements.

We must never lose sight of the fact that the Safety at Sea Conventions of 1914 and 1929 are merely steps along the path to safety. We must not lull ourselves into a feeling of security by the argument that loss of life at sea in proportion to miles traveled is very small. This can be considered a satisfaction, but not an argument against further and continuous efforts to reduce annual losses. Also we must not be quieted by the statement sometimes heard that ships can be made so costly that no one can travel on them. That is not a sound argument because the safety features do not mean much, if any, increased cost, if and when handled in the initial stages of a design. Surely the assurance of safety will be an appeal to the traveler quite as strong as the much advertised luxurious public rooms and appointments to which there appears to be no limit in sight and which certainly do add much to the cost of construction and of maintenance.

Subsidy Application Procedure

The Maritime Commission apparently is starting out to upset all traditions. Its initial order for procedure in Construction — Differential Subsidy and Operating — Differential Subsidy Applications was launched on Friday the 13th of November. Any old shellback will tell you what will happen to that ship.

Surely a commission two-thirds composed of old U. S. Navy "sea dogs" could at least refrain from encouraging future misfortune when so simple a change as one figure in the date line would have put them in the clear.

The order reads as follows:

"Correspondence and original applications for construction-differential subsidies shall be routed directly to the Secretary of the Commission for action. After review, the Secretary shall acknowledge the receipt of these applications and forward a preliminary questionnaire to the applicant. When the preliminary questionnaire is returned to the Commission, it will be referred directly to the office of Commissioner (M.M.) Taylor for consideration. Commissioner Taylor will be responsible for the review of the preliminary application and, if approved, the forwarding of a formal, detailed application to the applicant for execution. When the formal application is returned, it will be forwarded to Commissioner Taylor's office where it will be analyzed, subject to the recommendations of the interested divisions, for the adequacy of the constructional features, the trade route into which the ship is to be placed, along with its value in the development of the trade facilities, and the financial standing of the applicant. Commissioner Taylor will be responsible for the coordination of the various divisions' opinions and the submission of the application, along with recommendations, to the Commission for decision.

"This same general procedure shall be followed in the handling of requests for operating-differential subsidies.

"All matters of a fiscal or procedural nature, involving the expenditure of funds or contacts with other Government activities, except those of a constructional nature, will be referred to Commissioner (George) Landick. Commissioner Landick will be responsible for the development of complete information from the interested division or divisions and for the submission of these matters, along with recommendations, to the Commission for action."

Twenty Five Years Ago

The December, 1911, *Pacific Marine Review,* "First Established and Only Exclusively Marine Paper Published on the Pacific Coast," was issued from its office, 379-380 Arcade Annex, Seattle, Washington, on the 15th of that month.

Its lead articles discussed the "Panama Canal Tolls" question and other features of the great ditch, which was then well under way and close enough to completion to make the system of tolls a very live issue. (It is interesting to note that one of the unfinished tasks of the last Congress had to do with a revision of the system of assessing tolls in that same waterway. Had they taken the advice of the editor of Pacific Marine Review then, they would not need to scratch their heads so hard now.)

The Pacific Coast Steamship Company was then getting ready to order the S.S. Congress, and the Alaska Steamship Company was negotiating with the Oceanic Steamship Company for the purchase of the S.S. Mariposa. They already had under charter, with an option to purchase, the sister vessel, S.S. Alameda. The famous passenger and cargo liner, Cap Finisterre, was on her maiden voyage in the South American service of the Hamburg-America Lines. Five hundred and sixty feet long by 65 feet beam, with two quadruple expansion engines of 11,000 horsepower maintaining 17 knots, this vessel was the first to have a dining saloon of two decks clear height. She was provided with a large swimming "bath," gymnasium, hothouse, darkroom for photographic work, anti-rolling tanks, a winter garden, and a special dining room for children. She long remained the standard of excellence in passenger accommodations on the South American run.

The U. S. Lighthouse Service had recently been reorganized and given a simpler and more direct administration under a single bureau in the Department of Commerce and Labor. This had effected savings in personnel amounting to 200 positions, savings in rents of offices and docks, and lighthouse tenders, and yet the service was steadily extending.

Oil versus Coal was still a current topic in waterfront discussions. The experience of the Golden Gate, a San Francisco harbor tug doing revenue cutter duty, was set forth in an article by Chief Engineer C. A. McAllister. This tug had been converted to an oil burner at a cost of $2,500. This enabled her to effect the elimination of one fireman at $674 yearly, and to make a saving in cost of fuel equal to more than $2,000 yearly. In other words, the change over from coal to oil paid for itself in less than a year. Captain J. W. Troup, manager of the British Columbia Coast Service of the Canadian Pacific Railroad, announced the decision to equip a few of the vessels under his charge for the burning of oil.

The Nippon Yusen Kaisha was extending its services in the South Pacific. The Railway Bureau of Japan was considering a railway suspension bridge 3,000-foot span over Shimonoseki Straits. S.S. Nippon Maru was being announced as a new "Intermediate Class" passenger and cargo liner on the San Francisco-Yokohama run.

An announcement recorded the completion of the first unit of a floating dry dock for the Craig Shipbuilding Works at Long Beach. The second unit was under way. Together, these two units would have a length of 515 feet and a clear width between walls of 76 feet, and would be able to accommodate "the largest vessels calling at Southern California ports." This was the first dry dock in Southern California.

We noted "with sincere regret" the death of Captain John Birmingham, supervising inspector in the 1st District for the Steamboat Inspection Service. Captain Birmingham had been Supervising Inspector at San Francisco for 22 years, and "all who came in contact with the office and the man had learned to admire him for his gentleness and justice in all his actions."

Press Comment on the Maritime Strike

Two recent editorials on the maritime strike are rather interesting. Both are from Los Angeles. Both are mild, but pointed and thought-provoking. The first, entitled "Unfair," is from the Harbor Digest, a monthly which represents semi-officially the harbors of Long Beach and Los Angeles. The second, entitled "Strike," is from the Commercial News, Los Angeles, a weekly commercial newspaper.

"Unfair is a term much used by union labor in presenting its case against those firms and businesses with which union policies are in conflict.

"Yet even friends of labor are justified in asking if waterfront labor along the West Coast is fair in taking the attitude it has shown for the last two years.

"At this time the whole coast is in very much of a quandary as far as shipping is concerned because the shipowners and the public do not know what to expect next from the International Longshoremen's Association.

"Since the 1934 award there has been a constant wilful breaking of its contracts and now it refuses to arbitrate the points that have come up since that award or to make a new contract.

"The majority of outside labor unions do not condone the actions of the I. L. A. and many have done what they could to make the I. L. A. see their error in pursuing such a policy."

"Strike" . . . "What are the issues of the waterfront strike?

"As an interested observer, the Commercial News' own answer is:

"The basic issue is whether the maritime unions will recognize the employers."

Diesel Fuel Oil Research

Its History and Present Status and the Specifications Arising Therefrom

By Dr. A. E. Becker, *Standard Development Company, New York, N.Y.*
and Mr. M. J. Reed, *Diesel Engine Manufacturers' Association, New York, N. Y.*

The following known properties of fuel oil must be given attention not only in any attempt to set specifications but also in developing fuels and engines:

Ignition quality
Viscosity and pour point
Carbon residue and ash
Water and sediment
Sulphur
Flash point

Investigation of any one of these properties will be concerned more or less with the others, but in the interests of clarity we discuss the various items separately.

● Ignition Quality by Engine Test

Ignition quality means the degree of ease with which the fuel ignites and the rapidity with which it burns when injected into the cylinder of a diesel engine. This quality is frequently the most important of any of those listed. The diesel cycle depends for ignition on the injection of fuel into a heated mass of air so that the significance of ignition quality is obvious. As far back as 1919 attempts were made to link this property with spontaneous ignition temperature as determined in a bomb. This work and subsequent bomb experiments have shown that the temperature required for ignition varies markedly with such factors as delay period, air-fuel ratio, atomization and turbulence.

Subsequently it has been found that the temperature required for ignition in actual engines also varies with such factors which are briefly defined as follows:

Delay Period is crank angle in degrees between the beginning of fuel injection and the point at which the pressure begins to rise rapidly as a result of combustion.

Air Fuel Ratio is the ratio of the weight of air in the cylinder to the weight of fuel injected.

Atomization refers to the extent to which the fuel has been subdivided and dispersed in the process of injection into the cylinder.

Turbulence is the degree of agitation of the cylinder contents (first air and later mixture), during injection and combustion.

The modern laboratory engine method of investigating ignition quality dates from the experimental work of LeMesurier and Stansfield, and Boerlage and Broeze, and Pope and Murdock. Boerlage and Broeze used a slow speed engine and obtained variation in compression ratio by throttling the air inlet. Each fuel was compared with blends of cetene and mesitylene to determine the blend having the same delay angle. Later alpha-methylnaphthalene was substituted for mesitylene. Each rating was expressed as the per cent cetene in the blend which matched the fuel under test. Pope and Murdock ran their tests using a modified C.F.R. variable-compression knock-testing engine. The rating was expressed as "critical compression ratio" (C.C.R.), this being the lowest compression ratio at which the fuel being tested would just ignite under controlled conditions of speed, temperature, injection advance and pressure, fuel quantity, and inlet air.

Cooperation between these investigators further refined the engine testing method by improvements in the C.F.R. engine design and the development of more exact apparatus for the determination of delay angle. A factor in the extension of this work was the formation of the so-called "Volunteer Committee for Compression Ignition Fuel Research", which is composed of members of the Petroleum and Diesel Engine Industries actively engaged in experimental work with the modified C.F.R. engine. The work of this committee is not yet finished, but great progress has been made.

Different batches of cetene used by the Volunteer Group varied somewhat in ignition quality, either because they were composed of varying percentages of the several varieties of cetene or because of impurities. In an effort to make pure cetene, The E. I. duPont de Nemours Company found it much easier to prepare pure cetane, a saturated hydrocarbon. Not only can this be more readily duplicated, but the committee members found that the ignition quality differed only slightly from that of cetene. Accordingly they have standardized upon **cetane** numbers rather than cetene numbers as originally proposed by Boerlage and Broeze.

Some investigators have been approaching the problem of engine ratings from a somewhat different angle, namely, that of determining the octane number of a blend of 25 per cent of the diesel fuel under test and 75 per cent of a reference gasoline of known octane rating. The "Blending Octane Number" of the diesel fuel is then calculated from the rating of the mixture and that of the reference gasoline. It is claimed that such "Blending Octane Numbers" correlate well with cetane numbers as determined by the Delay Method. One must keep in mind, however, that such ratings are in an inverse relationship to cetane numbers; that is, the lower the "Blending Octane Number," the better the ignition quality of the fuel oil.

● Ignition Quality by Fuel Property

The high cost of laboratory test engines and the specialized technical personnel required for their operation has led many investigators to attempt to find an index of ignition quality obtainable from fuel properties which are easily determined by routine laboratory methods. These investigators have developed several such indices based upon two or more properties, such as viscosity, gravity, analine point and distillation temperatures. One of the first of these to combine two properties, the so-called "Diesel Index", is perhaps the most widely used today. This index, as well as "Viscosity-Gravity Constant," "Boiling Point-Gravity Number," and "U.O.P. Characterization Factor" are means for expressing the "paraffinicity" of fuels, engine and field work having shown that the more paraffinic a fuel, in general the better its ignition qualities.

In Diesel Index, analine point as a means of expressing "paraffinicity" is corrected by gravity. Likewise gravity is used as a modifying factor for viscosity or boiling point, as the case may be, in the other indices mentioned.

Such indices cannot be expected to be indicative of the ignition quality of fuels to which chemical substances classified as "dopes" have been added. As a matter of fact, for doped fuels engine methods give values which are not in line with correlation curves for standard commercial fuels.

These indices are already being used to a considerable extent, and the probabilities are that one of them will be adopted by common usage as a field method for estimating ignition quality even after an engine method has been standardized. However, the latter will always have to be the final reference.

● Viscosity and Pour Point

Viscosity has an important bearing upon fuel nozzle efficiency and handling from the storage tank to the engine cylinder. Pour point must be considered along with viscosity in problems of storage and handling.

Viscosity, gravity and surface tension are the oil properties which affect the hydraulics of injection and spray dispersion. Much experimental work has been conducted—in this country principally at Pennsylvania State College and the Langley Field station of the National Advisory Committee for Aeronautics—on injection systems and fuel sprays. The application of most of the findings has been on injection system and engine design, but it has been established that dispersion becomes more even as viscosity is decreased. More exact information could be used on permissible variations in viscosity without change, or with minor changes only, of injection system adjustments.

Early engine experiments on the effect of viscosity were mainly concerned with finding out what maximum value could be utilized without impairing efficiency. With the advent of the high speed diesel, the emphasis is now shifted to consideration of the allowable minimum viscosity. To meet higher requirements of ignition quality and cleanliness, fuel producers have furnished oils of lower viscosities. Some engine manufacturers contend that low viscosity fuels cause nozzle and pump wear and reduction of pump volumetric efficiency. This contention is based almost entirely upon field results obtained under conditions where the effects of viscosity, if any, cannot be separated from the influence of dirt contamination. Experiments now being conducted may throw considerable light upon this subject.

● Carbon Residue and Ash

Early investigation into the effect of fuel properties on engine operation laid great emphasis upon carbon residue as determined by the Conradson Method. Inspired by the A.S.M.E. Progress Report, a number of manufacturers ran tests on fuels containing 3 to 6 per cent Conradson carbon in the years 1930-31. Most of these tests were made using engines of relatively large cylinder dimensions, operating at what is today considered slow speed; the smallest engine used had a bore of 7 inches and was run at 650 r.p.m. The last tests along this line were conducted by the U. S. Navy at the Submarine Base at Groton, Connecticut, using an engine of about 10 inch bore at 375 r.p.m.

Unfortunately, at the time when these experiments were conducted there was no practical means for determining the ignition qualities of the fuels tested, or even much appreciation of the importance of this quality. Undoubtedly the test fuels did vary in ignition quality, and the test results were, therefore, not conclusive, in that poor operation and increasing fuel consumption (attributed at that time to higher Conradson carbon) may have been due to poor ignition quality.

Diesel engine manufacturers and oil refiners are agreed that limitation of Conradson carbon is still important. The exact limits for different sizes and types of engines are somewhat a matter of opinion although this, in turn, is based upon field experience. Some manufacturers and refiners feel that the quality of fuel which is supposed to be measured is not characterized accurately enough by the Conradson determination. Various other tests have been suggested, such as the combustion residue test recommended by the Atlantic Refining Company. If the Conradson test for carbon is really not indicative, some other test ought to be developed and standardized. Then there should be some systematic experimental work devoted to finding practical limits for carbon content of fuels intended for various types and sizes of diesel engines.

Carbon deposits in engines can be the result of causes other than Conradson carbon content. Some of these are poor spray distribution, erratic injection and overloading — any one or more of which can give trouble even though the fuel may have low Conradson carbon.

The Conradson carbon determination serves as a check on the amount of high boiling point fractions in the fuel such as distil above 700 deg. F. The limit on the amount of fractions boiling above this point is still being actively investigated.

Ash in fuel oil is commonly believed to be a cause of cylinder wear. Refiners seem to experience no difficulty in producing practical fuels very low in ash content, so that there is today not much discussion along this line. It is commonly believed that dirt contamination is responsible for considerably more wear than can be attributed to ash content of the fuel as it leaves the refinery.

● Water and Sediment

The ignition quality requirements of high-speed engines are such that refiners have been forced to produce fuels so high in general quality that only traces of water and sediment are present. The problem is to prevent contamination from the time fuel leaves the refinery until it is consumed in the engine. Just as the gasoline user has had to learn to keep water out of gasoline, so must the diesel operator learn to protect his fuel against dirt contamination.

So far as concerns fuels for heavy-duty engines, there are few or no experimental data to show what effect, good or bad, water has when present in the usual amounts occurring in heavier fuels. The consensus is that it has no effect. It is generally known that sediment causes wear of fuel pump and other injection parts. Slow-speed, heavy-duty engines, in general using higher viscosity fuels, are less sensitive to this factor. Experiments now under way on the use of low-viscosity fuels should increase our knowledge in a quantitative way of the amount of dirt contamination that can be tolerated.

● Sulphur

The effect of sulphur is a controversial subject. It has been known for some time that sulphur causes corrosion of steel exhaust lines and mufflers in intermittent and idling operation. On the other hand, numerous operators have used high-sulphur fuels in engines on more or less continuous duty without having observed any ill effects. This field experience comprises practically all the information on the subject.

Diesel electric auto-ferry Golden Gate. America is gradually accumulating diesel experience but is far behind in ocean going motorships.

Difficulties experienced in the oil-fields where diesel engines are operated on crude oils have been attributed by some to the sulphur content. The field data are such, however, that it is impossible to segregate any effect of sulphur from that of the fine sand which is almost always present in crude oil. In any case the forms of sulphur, mostly hydrogen sulphide, which have been blamed for these troubles do not occur in refined fuel oils.

Those who have made a study of diesel fuels seem to be in agreement that sulphur does not present an important problem. There are still many users who are inclined to attribute all difficulties with fuel to its sulphur content. This point of view is a heritage from the past, and will undoubtedly change when users become better acquainted with the experience of those who successfully use fuels of high sulphur content.

● Flash Point

Apparently flash point is of little significance so far as the operation of a diesel engine is concerned. This is amply demonstrated by the fact that many engines in the oil fields successfully burn crude oils of low and high flash points. Flash point is of importance, however, because of fire hazards in storage and handling. Insurance regulations and state laws recognize this and include provisions for minimum flash point.

● Recent U. S. Navy Experiments

While it is impossible to cover all of the valuable work in progress or recently reported on, no resume would be complete without a mention of the extensive experimental work during the past two years conducted by the U. S. Naval Engineering Experiment Station, Annapolis, Maryland. This work is of special interest to the diesel industry because a most important angle, so far as the Navy is concerned, is to be able to decide upon one specification for fuel to be used in all its equipment. Conclusions to date are based upon data obtained from not only laboratory test engines but also commercial engines similar to those in actual use on Naval vessels. Twenty-five fuels, varying widely in ignition quality, and from 33 to 57 S.S.U. viscosity at 100 deg. F., from minus 40 to plus 30 deg. F. in pour point, from

Passenger motor liner Chichibu Maru of Toyo Kisen Kaisha. Japan has many fine transpacific motorships.

0.004 to 2.12 per cent carbon residue, from 0.06 to 1.03 per cent sulphur, and from 168 deg. to 232 deg. F. flash point were investigated. The work is being extended to cover another series of twenty-five fuels. In the meantime no major conclusions have been drawn. Recommendations for Navy fuel specifications are given as follows:

Flash point, closed cup, deg. F. Minimum	150
Pour point, deg. F. Maximum	0
Viscosity, SSU @ 100 deg. F Minimum	35
Maximum	45
Water and sediment, per cent Max.	0.05
Total sulphur, per cent Maximum	1.0
Carbon residue, per cent Max.	0.2
Ash, per cent Maximum	0.01
90 per cent distillation temperature, deg. F. Maximum	675
Corrosion at 212 deg. F.	negative
Diesel Index Number, Minimum	45

● American Society for Testing Materials

The demand for some classification of diesel fuels was such that Technical Committee C of the American Society for Testing Materials appointed a "Coordinating Subcommittee on Diesel Fuels" early in 1934 with a commission to collect and classify data and to prepare tentative specifications if possible, and if not, some classification. Membership includes representation of Technical Committee C, the Volunteer Committee for Compression Ignition Fuel Research, the American Society of Mechanical Engineers, the Society of Automotive Engineers, diesel engine manufacturers and fuel producers. The Subcommittee drafted its first Classification which was published by the American Society for Testing Materials in 1934. This was revised in minor respects in 1935, and the plans of the Subcommittee contemplate the recommendation of slight further changes at the June meeting of Technical Committee C.

While present knowledge of the subject is too incomplete to permit even tentative specifications, this Classification has proved useful throughout the industry in an informative way. It closely parallels the recommended specifications of the U. S. Navy.

● Things to be Done

From the angle of engine design and performance a satisfactory solution of the ignition quality problem is essential. Such a solution will involve:

(1) The establishment of a standard laboratory test method that will yield reproducible results and will correlate with performance in service;

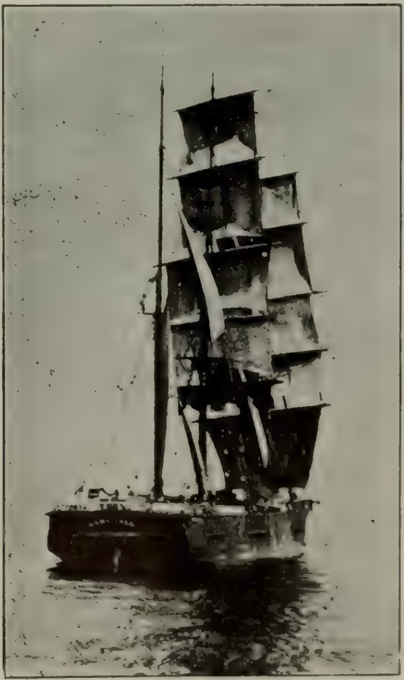
(2) The production of fuels of adequate ignition quality at a reasonable cost;

(3) Design improvements that will make engines operate satisfactorily on a wider range of fuels.

Satisfactory progress is being made in regard to (1) by the Volunteer Committee, the U. S. Navy and others, both individually and collectively. There is great need for more correlation data between laboratory tests and commercial engine performance, although some fuel producers have already made notable contributions.

So far as (2) and (3) are concerned, only the barest mention of possibilities is in order here. The increased adoption of supercharging, the resort to higher compression pressures, and refinements in injection apparatus and combustion chamber design will all, no doubt, contribute materially to the solution of the ignition quality problem.

At the present time the fuel producers' problem is complicated in many districts by the impossibility of using the same fuels for diesel and household burners to get reasonable distribution costs for the former. When high-speed diesels are widely enough distributed to justify separate fuel distributing facilities universally, special refining treatments, now available, can and will be used.


The American bark Germania, of San Francisco. This fine sailing ship operated for nearly fifty years on the Pacific Coast without an accident. She was scrapped in 1900.

Of importance in connection with ignition quality is the subject of so-called "dopes", or chemicals to be added to fuel to improve its rating. Not only must a successful dope be effective in this respect, but it should be safe to handle and ship, easy to blend, and low in cost. The last requirement would seem to be essential in order to compete with improvement of fuel by refining methods or with wider acceptance of fuels by way of engine design.

Present discussion about viscosity is centered around what minimum value can be tolerated without detrimental effect to injection parts and on what viscosity range can be handled without major adjustment of fuel injection systems. An accepted conclusion that low viscosity fuels are entirely satisfactory would have the effect of materially widening the sources from which diesel fuel can be drawn, as well as minimizing the low pour point problem.

There is a need for study of better methods for preventing contamination of fuels with dirt during storage and in handling. There should be more thorough analyses of field difficulties commonly attributed to dirt or low viscosity, as the case may be, to determine which is really responsible. Those who contend that sulphur limits should be reduced should obtain any present data substantiating their position. If the Conradson test is not the proper one to evaluate the effect of residual carbon, a more indicative test should be proposed and, if generally accepted, limits for carbon content by such a test should be established by laboratory and field experimentation. As these various problems are solved, specifications for diesel fuel will logically develop from the American Society for Testing Materials Classification.

[Abstracted [illegible] Meeting of the American Society of Mechanical Engineers [illegible]]

Naval Architects and Marine Engineers

44th Annual Meeting of National Society Produces Nine Papers of Great Technical Interest

The forty-fourth general meeting of the Society of Naval Architects and Marine Engineers was held in the Engineering Societies Building, New York, on November 19 and 20. At the four technical sessions nine papers were read. These papers covered a wide variety of technical subjects, ranging from "River Tow Boats" to "Welded Piping in Central Station Steam Plants." The following abstracts were prepared from preprints of these papers placed at our disposal through the courtesy of the Society.

Some Experimental Studies of Sailing Yachts, by Kenneth S. M. Davidson. The author of this paper is the director of the experimental towing tank at the Stevens Institute of Technology, Hoboken, N. J. In 1932 he began experimental studies into the behavior of small models. After careful study and analysis, a procedure was developed by which the results from the towing tests of two three-foot waterline models were very comparable with the actual measured resistances of the full sized yachts.

The author makes a careful and very interesting force analysis of the wind and water actions on a sailing yacht, both in the upright position running free, and in the heeled position close hauled under various sail conditions.

An ingenious apparatus was developed for making model tests with heel and leeway. This was so perfected as to measure the lateral force without restraining the model in any other way.

Features of Practice Affecting Design, by Lieutenant Commander W. P. Roop, of the Construction Corps, United States Navy. This is a very useful paper. Its purpose, as set forth in the first four paragraphs, is as follows:

"In refinement of design to obtain decreased weights, the first object would be to locate surplus metal contributing nothing to strength and then remove it. This process has been going on for many years, so that an even higher premium on weight reductions has extended the process only to a moderate degree.

Masts like this one on the sloop Yankee present interesting problems in sail force applications.

"An equally obvious resource which has also been extensively used is material superior to mild steel in the proportion of strength to weight.

"The real kernel of the weight question is not approached, however, until the effort is made to reduce nominal safety factors without incurring risk of failure.

"In order that proposals for weight reduction may receive systematic and unbiased scrutiny it is useful to tabulate the separate considerations which may legitimately be applied."

The author then discusses these separate considerations under 21 questions, covering features of practice, and under 5 subheads, covering choice of permissible safety factor.

The subjects contacted, as given in his own summary, are: Rigidity versus strength; qualitative comparisons; nominal calculations; alterations; improbable, dynamic, cyclic, and combined loads; stress concentrations; progressive failure; stress limits; corrosion; local defects; fit, personal responsibility, acceptance tests, process control, selective tests, and the human element, all as applied to workmanship; effective, nominal and actual safety factors; risk and margin; factors determining safety factor; and reserve of strength.

The author's closure reads:

"This review makes no claim to offer guidance as to what may be suitable values for safety factors. It is a plea for recognition of the part that chance unavoidably plays in the choice of such values and for open-minded acceptance of the principle that where chance can not be avoided the rational procedure is to balance one risk with another so as to obtain the most favorable all-round result.

"Closed scrutiny of the details of the various considerations affecting design should lead to more exact control of the variables involved, with a reduction of uncertainties, and hence of risk, at the same time that weight not needed is removed.

"Personal opinion naturally can not be eliminated and the rational solution that will completely satisfy everyone does not exist. But intuitions that are not founded on facts are dangerous.

"The active promotion of experiment, research, and analysis is essential to progress in design."

This paper should provoke some very interesting and constructive discussion.

Modern River Tow Boats, by James S. Brodie. Mr. Brodie is the superintendent of maintenance at New Orleans for the Federal Barge Lines. He is therefore in a position to talk with authority on this subject. His organization began from scratch in 1918 and has built up one of the finest river cargo transportation services in the world. He gives a thorough treatment of the subject, discussing the various types of river tow boat hulls and tow boat drives and their development.

The experience of the government agency in building Federal Barge Line tow boats leads to the conclusion that, regardless of the type of hull or drive, and within the 1000 to 3000 horsepower range, a tow boat fully equipped with "all the necessary adjuncts for accommodating a full crew and doing general river towing service will cost approximately $220.00 per shaft horsepower. This figure is close enough for general first cost estimates."

The table herewith shows total overall operating costs of various types of river tow boats. Seventy per cent of the movement is upstream, and all costs, such as overhead, depreciation, maintenance, and operating are included.

Oil Tankers, by John W. Hudson. John W. Hudson is naval architect of the Sun Shipbuilding and Dry Dock Company. This paper traces the development of the modern tanker and makes a comparative strength analysis of the center line bulkhead type and of the twin bulkhead type, both in the "sagging" and in the "hogging" condition with various loadings. The author's resume of these analyses "would indicate that the sagging condition is productive of the greatest stresses, that the stresses of the hogging condition are of minor importance, that under normal loading conditions the twin bulkhead ship is the more desirable and that a logical ballasting condition should be adopted to avoid undue straining of the vessel's structure. "

U. S. Army Engineers tunnel stern screw propelled river towboat Coiner is powered with two 650 brake horsepower Winton diesels.

Type	1935 Cargo ton miles (thousands)	 Average cost per ton mile (mills)
City (twin-screw, tunnel, triple-expansion engines, 1800-horsepower). Average of six sister ships....	124,361	0.96
State (twin-screw, tunnel, triple-expansion engines, 2400-horsepower). Average of 2 steamers, the Illinois and Minnesota, which were converted from unsatisfactory sternwheelers	132,347	0.925
Mark Twain (1000-horsepower steam sternwheeler)	40,535	1.34
Tom Sawver (1180-horsepower diesel)	43.699	1.30

Cost of operation on river towboats.

In regard to fast tankers for naval auxiliaries, the author makes the interesting suggestion that (since single screw vessels would hardly be acceptable for naval use) the hulls for tankers chosen for this purpose be fitted for triple screws and shafts. Boilers and turbines would be installed for the two outside shafts and a diesel on the central shaft. In commercial use the outside propellers would be removed and the diesel engine only used for propulsion. The boilers in comercial use would supply steam for heating and for auxiliary power. On transfer to emergency naval use, the wing screws would be installed and the 12 knot tanker be ready to do 18 knots.

"The possible savings in weight, and the added simplicity, are sufficient to justify the prediction that in the near future all ships will be completely welded; and the welded structure in a tanker offers a simpler problem than does that in a cargo or passenger vessel.

"There seems to be no reason why all the details peculiar to tankers cannot be standardized, as it is quite obvious that the differences are largely matters of opinion rather than of necessity."

Further Developments in the Stability and Rolling of Ships, by J. C. Niedermair. This paper is a continuation of the 1932 paper, "Stability of Ships in Damaged Condition," by the same author. Mr. Niedermair is connected with the Bureau of Construction and Repair, U. S. Navy Department, Washington.

The former paper suggested that maximum metacentric heights (G. M.) for comfort in a seaway should lie between the limits of 0.05 B and 0.06 B where B is the maximum beam. The present paper presents a more definite formula for beams from 50 to 100 feet; i.e.,

$$GM = 0.06\ B - \frac{350}{(B/10)^4}$$

This is for the maximum G.M., and exists in a passenger vessel only at some particular condition of loading, usually the full load condition, for a relatively short time during the voyage.

From his mathematical analysis, the author concludes as follows:

"1. Head seas will seldom cause synchronous rolling in ships with a

	Merchant Vessels			Naval Vessels	
Type of boiler	Standard water-tube boiler	Radiant type boiler and boiler with forced water circulation	Velox	Forced watertube boiler	Velox
Combustion chamber heat release, B.t.u.'s per cu. ft. per hr.	34,000–67,000	67,000–135,000	500,000–800,000	135,000–280,000	670,000–1,000,000
Evaporation per unit of heating surface, lb. per sq. ft. per hr.	5–7	8–11	90–115	15–20	115–135
Heat Transmission, B.t.u.'s per sq. ft. per hr:					
Evaporator	5000–7000	7000–10,000	85,000–120,000	11,000–18,500	90,000–130,000
Superheater	3000–4000	4000–7000	18,000–35,000	5500–10,000	22,000–37,000
Economizer	900–1800	900–1800	5500–9000	1500–(3000)	5500–10,000
Boiler room: Floor area required, sq. ft. per ton of steam per hr.	43–27	27–16	14–10	14–10	9–6.5
Space required for boiler including uptakes, cu. ft. per ton of steam per hr.	1400–900	900–550	550–300	230–160	160–100
Weight of boiler, including all boiler room auxiliaries, economizer, preheater, piping, fittings, brickwork, insulation, uptakes and water, lb. per lb. steam	7.5–6	4–2.5	1.8–1.1	1.8–1.3	1.2–0.8

Comparison of Velox with other water tube boilers in merchant and in naval vessel installations.

complete period above 12 seconds.

"2. When in synchronism a change in course or a change in speed will reduce the synchronous action.

"3. A combination of change in course and a reduction in speed will reduce synchronous rolling when the course of the ship is cut in closer to the wave crest.

"4. When the angle between the course of the ship and the wave crest is increased with a decrease in speed, synchronism may not be materially changed. Good judgment is evidently required successfully to reduce synchronism by this maneuver.

"5. As speed is increased, the course for synchronism approaches a constant angle relative to the wave crest for speeds above 20 knots at a given ship period in waves of 200 to 700 feet in length.

"6. The general conclusion is that the metacentric heights considered in the foregoing text are acceptable from the standpoint of ship periods of roll, particularly since it is observed that the other factors such as speed and course practically control the point of synchronism, providing, however, that when running parallel to the wave crest the ship does not come within any serious synchronous zone. Our studies indicate such zone is avoided with the proposed maximum metacentric height."

Velox Steam Generator for Merchant and Naval Vessels, by Dr. Adolphe Meyer, managing director, Brown Boveri and Company, Baden, Switzerland.

The Velox boiler is beginning to make its way aboard several rather important European ships as a means of increasing power and speed while saving space and weight. This paper describes the boiler, thoroughly explains its peculiar properties, gives particulars of several installations, and outlines possibilities on such ships as Normandie, Queen Mary, Asturias, Potsdam, a destroyer, a submarine, and two battleships.

Heat Insulation, by Captain Ormond L. Cox, director, U. S. Naval Engineering Experiment Station, Annapolis, Maryland.

"The present-day high-pressure steam plants, with temperatures in excess of 500 degrees F., have created a new problem in heat insulation. The old standby for many years, 86 per cent hydrated magnesia carbonate insulation, is not suitable as it calcines and decomposes at temperatures in excess of 500 degrees F. An extensive amount of research has been conducted by various manufacturers in an effort to develop and produce insulating materials for the higher temperatures, which will meet the Navy Department requirements as to conductivity, structural strength, weight, etc. In general no single material will meet all of the requirements, with the result that different types are being used.

"This paper discusses heat-insulating materials from the standpoint of the requirements of the naval service, service experience and the results of tests conducted at the U. S. Naval Engineering Experiment Station."

After describing the experimental procedure and the reasons for discarding some materials of very excellent insulating quality, the author concludes:

"The various types of insulating materials discussed in this paper have been approved for use in the naval service. There are undoubtedly other types which to date have not yet been tested for conformance to naval requirements. Some types, which are not discussed in this paper, have been tested and found to be unsuitable for naval use. A number of types have been rejected on account of their relatively high weight. The present weight and space restrictions in naval construction create a demand for light and compact materials. Manufacturers are aware of this and are continually striving to produce lighter and lighter heat-insulating materials possessing at the same time the other required characteristics and properties.

Arc Welded Piping in Central Station Steam Plants, by C. F. Hirschfeld and D. H. Corey, respectively chief of research and welding engineer, Detroit Edison Company.

This paper is an excellent example of the benefits that are available to marine power plant engineers through a study of shore side practice.

It recites how considerations of maintenance and of first cost have led to an ever-increasing use of arc welding in piping for high pressure, high temperature steam plants. It shows the behavior of welded pipe joints under hydrostatic tests.

It discusses welded joint design, welding procedure, weld inspection, and stress relief. "A convenient and satisfactory method of accomplishing stress relief by an application of electric induction heating of the pipe" as developed by the authors is described and illustrated.

Propeller Vibration, by Frank M. Lewis. The author is professor of Marine Engineering at Massachusetts Institute of Technology, and the paper is a report of the last

Material	85% Magnesia Molded Insulation (Pipe and Block)	Diatomaceous Earth Molded Insulation (Pipe and Block)	Rock Wool Blanket Insulation	Insulating Cements			Asbestos Blanket and Pad Insulation	Insulating Tape
				Diatomaceous Earth	Rock Wool	Exfoliated Mica		
Weight, lb. per cu. ft.	15–18	18.6–27.5	*15.0–19.0	28.6–36.6	29.4–36.0	17.0–18.0	13.0–14.2	13.8–21.0†
Hardness by plastometer, 1/100 mm.	55–102	30–95	....	41.0–51.0	66.5–121.4	159.0–185.0	....	....
Resistance to abrasion (structural strength):								
Loss in weight, per cent after 1st 10 min. run	21.7–31.0	11.5–40 0	....	6.0–20.6	22.0–35.4	25.0–30.0	....	....
Loss in weight, per cent after 2nd 10 min. run	36.3–49.3	21.2–60.0	....	11.4–40.8	45.0–57.3	45.0–50.0	....	....
Hardness after soaking heats:								
After heating 6 hrs. at 750 deg. F.	....	57–93	....	19.0–50.0	40.2–145.0	144.0–151.0	....	....
After heating 6 hrs. at 1000 deg. F.	....	49–95.5	....	20.5–48.0	36.0–139.0	131.0–138.0	....	....
After heating 6 hrs. at 1200 deg. F.	....	44–109	....	21.5–53.0	35.0–130.0	130.0–136.0	....	....
After heating 6 hrs. at 1500 deg. F.	....	40–112.5	....	24.5–56.0	31.8–118.0	120.0–130.0	....	....
After heating 6 hrs. at 1800 deg. F.	....	31–154	....	19.0–75.0	21.0–101.0	Too Soft	....	....
Change in weight due to soaking heats:								
Per cent loss in wt. after heating 6 hrs. at 750 deg. F.	....	3.3–4.6	....	3.0–7.0	0.7–2.8	*Zero*	....	....
Per cent loss in wt. after heating 6 hrs. at 1000 deg. F.	....	3.4–5.0	....	5.0–11.0	1.0–4.8	1.0–1.3	....	....
Per cent loss in wt. after heating 6 hrs. at 1200 deg. F.	....	3.6–19.0	....	9.4–15.0	1.2–5.4	2.3–2.6	....	....
Per cent loss in wt. after heating 6 hrs. at 1500 deg. F.	....	5.4–20.0	....	10.5–18.0	1.6–6.1	4.3–4.7	....	....
Per cent loss in wt. after heating 6 hrs. at 1800 deg. F.	....	7.1–21.0	....	12.5–23.5	2.4–6.6	6.6–6.9	....	....
Change in linear dimensions due to soaking heats:								
Per cent shrinkage in length after heating 6 hrs. at 750 deg. F.	....	0.0–2.0	....	0.00–0.31	*Zero*	*Zero*	....	....
1000 deg. F.	....	0.0–2 0	....	0.00–0.68	0.00–0.63	*Zero*	....	....
1200 deg. F.	....	0.6–2.0	....	0.63–0.94	0.31–1.25	*Zero*	....	....
1500 deg. F.	....	0.9–5.0	....	0.93–4.36	0.63–2.52	*Zero*	....	....
1800 deg. F.	....	2.3–7.5	....	2.90–5.70	1.26–4.65	1.1–1.4	....	....
Moisture absorption:								
Moisture absorbed, per cent by weight	....	3.3–8.3	6.7–12.9	....	....	....	7.2–17.5	....
Moisture absorbed, per cent by volume	....	0.8–3.0	0.8–2.4	....	....	....	1.8–4.2	....
Water absorption:								
Water absorbed, per cent by weight.	....	144.0–254.0	31.0–676.0	....	....	....	284.0–332.0	....
Water absorbed, per cent by volume.	....	70.0–78.0	4.0–74.0	....	....	....	71.0–84.2	....
Water retained after draining 20 hrs. per cent by:								
Volume	....	57.0–68.0	0.0–53.0	....	....	....	55.0–65.0	....
Weight	....	117.0–212.0	0.0–499.0	....	....	....	224.0–256.0	....
Coverage capacity, sq. ft., 1" thick per 100 lb. material	....	....	....	41.0–58.0	45.0–69.0	75.0–84.0	....	....
Volumetric shrinkage (wet to dry), per cent	....	....	....	18.2–25.7	11.4–20.0	9.8–12.5	....	....
Adhesive properties, lb. per sq. in.	....	....	....	*Zero*	2.1–12.1	9.0–11.2	....	....
Tensile strength, lb. per in. width	....	....	....	....	....	....	....	162–208
Change in tensile strength:								
Per cent loss in tensile strength after heating 6 hrs. at 450 deg. F.	....	....	....	....	....	....	....	0–32
650 deg. F.	....	....	....	....	....	....	....	0–41
750 deg. F.	....	....	....	....	....	....	....	0–43
Change in weight:								
Per cent loss in wt. after heating 6 hrs. at 450 deg. F.	....	....	....	....	....	....	....	1.2–2.6
650 deg. F.	....	....	....	....	....	....	....	2.4–5.5
750 deg. F.	....	....	....	....	....	....	....	2.5–7.1

* As applied. † Weight in lb. per 100 lin. ft.

Tabular results of tests of various heat insulating materials.

years' work of the Vibration Research Commitee of the Society of Naval Architects and Marine Engineers.

"Measurements have been made on a 20-foot model of the President Hoover for vertical and transverse forces for both outboard and inboard turning screws. The vertical force measurements for outboard turning screws confirmed results previously obtained. On completion of these tests the bossings were removed. The ¾-inch diameter tubes carrying the shaft bearings were left in place and supported 2 inches from their after ends by a pair of struts having arms of elliptical section, ⅛-inch by ¼-inch, with a 60 degree V between them. Measurements of vertical force for inboard and outboard turning screws have been made with this arrangement.

"The vibratory forces for the condition with bossings removed are of the order of 30 per cent of those with bossings in place, proving that the bossings play a very important part in generating the vibratory force."

After considerable mathematical analysis, the author summarizes his results as follows:

"In the order of their importance, the vibration generating forces of blade frequency are:

"Bossing forces. Induced by the presure and velocity field of the propeller blades as they pass the line of the bossing;

"Hull suction forces. Induced by the pressure and velocity field of the propeller blades as they pass the surface of the hull;

"Bearing forces. Induced by the varying force on the propeller blades as they pass through the varying wake.

"Of these components, the bossing forces are of preponderant importance."

From Postal Contract to Subsidy

Regulations for Filing Applications Under Section 402 (a) Merchant Marine Act, 1936

By virtue of the authority vested in the United States Maritime Commission by the act entitled , "An Act to further the development and maintenance of an adequate and well-balanced American merchant marine, to promote the commerce of the United States, to aid in the national defense, to repeal certain former legislation, and for other purposes" (Act of June 29, 1936, Public No. 835, 74th Cong.), and in order to establish uniform procedure under Section 402 of said Act, the following Regulations are hereby prescribed:

● Article I, Application.

Any letter or telegram from the holder of any mail contract which was received by the Commission before midnight on the 27th day of September 1936, and which makes application to adjust the rights of the parties under any mail contract that is to be terminated as provided in Section 401 of the Merchant Marine Act, 1936, shall be received and filed as an application under Section 402 (a) of said act.

● Article II. Supporting Affidavit.

Every applicant under Section 402 (a) as above described shall, on or before the 10th day of December 1936, file with the Commission, in support of its application a separate affidavit as to each route, verified by a responsible official, containing the information required in Articles III, IV, V, and VI of these regulations.

● Article III. (a) Financial Statements.

Every such applicant shall file with the Commission the financial statements described in this article.

(b) Profit and Loss Statement.—There shall be included statements of profit and loss for each annual accounting period completed since the beginning of operations under applicant's ocean mail contract and for the intervening period, if any, to June 30, 1936. Each such statement shall be accompanied by a list of all contracts in effect with any holding, parent, subsidiary, or otherwise affiliated or associated company, and an analysis of income derived and expense resulting from transactions with any such company.

(c) Balance Sheet. — There shall be included a balance sheet as of June 30, 1936.

(d) Forms. — The balance sheet shall, and the profit and loss statements may, conform in content and style with the appropriate forms specified in the Annual Report and General Financial Statement for the Calendar Year 1935 prepared for the United States Department of Commerce and published by the United States Shipping Board Bureau (Cf.: Balance Sheet, Exhibit A, pp. 12-13; Income Sheet, Exhibit B, p. 37).

● Article IV. (a) Claims of Contractors

Every such applicant shall file with the Commission a statement of all claims of such applicant against the United States arising out of its foreign ocean mail contract or out of the termination thereof under the provision of Section 401 of the Merchant Marine Act of 1936.

(b) Amounts Withheld. — Any amount of money which any applicant claims to have been justly due it under its ocean mail contract, and

The Oceanic passenger liner S. S. Monterey and many other fine ships were built under the Subsidy clauses of the Merchant Marine Act of 1928. The shipbuilding subsidies of the 1936 act are even more generous.

PERIO[illegible] DEPT.

which has been withheld for any reason, shall be described in terms of amount, vessel, and voyage, and the circumstances under which it was withheld sufficient to enable the Commission to understand the nature of the controversy.

(c) Commitments Made.—Any and all commitments made by the applicant in reliance upon ocean mail contract payments as means of meeting and discharging such commitments shall be described in sufficient detail to enable the Commission to understand the nature and purpose of each.

(d) Other Claims.—Any and all other differences and claims, not included in paragraphs (b) and (c) above, which the applicant deems to have arisen out of its foreign ocean mail contract, or the termination thereof, or which the applicant deems to be within the meaning and intent of Sections 402 (a) and 402 (b) of the Merchant Marine Act of 1936, shall be stated by the applicant in such detail as to enable the Commission to understand the nature thereof.

### ● Article V. Vessels, Construction, and Reserves.

Every such applicant shall file with the Commission a statement covering the following points with respect to its ocean mail contract:

(a) Age and general physical condition on June 30, 1936, of each vessel used under the mail contract.

(b) Summary of the applicant's obligations, if any, under mail contract or under any other agreement with a Government agency, for the construction of new vessels, and of the extent to which such obligations have been fulfilled.

(c) Summary of reserves set aside or other provision or plans for replacements and/or new construction.

(d) List and cost of vessels constructed by applicant and used under its mail contract, together with any available information as to what would have been the cost thereof if constructed in a foreign yard.

● Article VI. Preliminary Proposal.

Every such applicant who contemplates the substitution, in whole or in part, for any foreign ocean mail contract held by it of a contract or contracts authorized in Titles V and VI of the Merchant Marine Act of 1936, shall file with the Commission a proposal for the substitution of such a contract or contracts. Such proposal will be received by the Commission as tentative and advisory, and the applicant will not be held to have submitted a continuing offer. Such proposal should include any suggestions which the applicant desires to make relative to rearrangement of services or necessary new construction in connection with its own or any related route.

● Article VII. Briefs

Any such applicant may file with the Commission such brief or argument in support of any or all of its claims as it may elect to prepare.

● Article VIII. Form and Filing of Statements.

Affidavits and briefs may be typewritten or printed. Paper, binders, or covers larger than 8½ x 11 inches shall not be used, except that schedules folded so as not to exceed that size may be included. Not less than ten copies, including the original, of each affidavit and brief shall be filed, provided that only the originals need be signed or sworn to. Verification shall be made by the affiant as of the best of his knowledge, information, or belief.

● Procedure for Handling Adjustments

November 17, 1936.

Effective this date, Commissioner George Landick, Jr., has assumed direction of the adjustment of existing ocean mail contracts, pursuant to the provisions of Title IV of the Merchant Marine Act, 1936, and the various functions incident to such adjustments will be supervised directly by him.

The development of statistical data and information required for such adjustments will be in direct charge of the Director of the Division of Research, under the supervision of Commissioner Landick.

James Craig Peacock, Special Counsel, will act as adviser to Commissioner Landick in connection with ocean mail contract adjustments in consultation with the Acting General Counsel of the Commission.

By order of the United States Maritime Commission.

[Seal] Telfair Knight, Secretary
Adopted November 6, 1936.

Trade Literature

Industrial Uses for Micarta. A booklet illustrating the many industrial applications of Micarta, a plastic material available in many grades and shapes, has recently been issued by the Westinghouse Electric and Manufacturing Company.

Listed are the mechanical and electrical properties, the standard forms available, such as sheet, rods, tubes, angles, channels, and specially molded pieces.

Specific applications in electrical manufacturing, radio, aircraft, automobiles, paper mills, steel mills, textile mills, and chemical plants are included.

Copies of the publication are available from the nearest district office or direct from the advertising department, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania.

Bulletin W-313-B1, a new eight-page bulletin illustrating and describing the improved Mixflo centrifugal pump, has been issued by the Worthington Pump and Machinery Corporation, Harrison, New Jersey.

The Mixflo, in sizes from 12 to 84 inches, delivers from 1000 to 225,000 gallons per minute at heads from 5 to 50 feet. It is widely used for irrigation, drainage, sewage disposal and condenser circulation service.

Trade Note

King-Knight Co. have sold to the Alta Electric Co. a 150 KW emergency generator set, automatic control, driven by a Sterling 6 cylinder 8 x 9 gasoline engine, to furnish emergency power for the Golden Gate Bridge.

J. C. Freese Co., of San Francisco, are equipping one of their barges to handle both gasoline and molasses, and purchased gasoline engine-driven pumping equipment with Kinney rotary pumps, one pump to unload 500 gallons of gasoline per minute and the other pump to unload molasses at the rate of 60 to 80 tons per hour. This equipment sold by King-Knight Co., of San Francisco.

Pacific International Trade

Culled from Recent Reports of U.S. Department of Commerce and Various Other Sources

In view of the present paralysis of Pacific Coast shipping, due to strikes of maritime labor unions, it is interesting to note the trend of improvement at the Panama Canal just prior to the calling of these strikes. Just as the world's ocean borne traffic is getting on an even keel, labor begins to rock the craft with the evident intention of causing her to founder. The following is from a recent official release to the press from the Canal Zone:

Improved conditions in world trade are reflected in figures released by the Bureau of Statistics of The Panama Canal, which show that during September traffic through canal increased 19.2 per cent in transits and 14.9 per cent in tolls, as compared to the same month of 1935.

This gain marks the continuation of an upward trend in traffic which began a year ago following a decline, which was more than seasonal, in the summer of 1935.

In the tabulation herewith the number of ocean-going transits and the amount of tolls collected are shown for the first nine months of the calendar year, with the daily average of transits and tolls and the totals for the first nine months of the calendar years 1935 and 1934:

Our Portland reporter caught this interesting snap recently.

In comparison with the first nine months of the calendar year 1935, the traffic in the corresponding period this year shows an increase of 15.1 per cent in transits and 11.6 per cent in tolls, while in comparison with the first nine months of the calendar year 1934, there was an increase of 8.4 per cent in transits and 2.3 per cent in tolls.

New Zealand: A renewal of the world's largest single shipping contract became operative on September 1, when the government of New Zealand signed up for another three years with four British shipping companies for the transportation of New Zealand meat, butter, cheese, wool, and fruit to the markets of Great Britain. This contract is said to carry a 2½ per cent raise in the freight rates on meat and dairy products, and its estimated value approximates $54,000,000 for the three year period.

Month	TOTALS FOR MONTH Transits	TOTALS FOR MONTH Tolls	DAILY AVERAGE Transits	DAILY AVERAGE Tolls
January	472	$2,018,543.52	15.23	$65,114.30
February	452	1,952,682.73	15.59	67,333.89
March	526	2,293,874.51	16.97	73,995.95
April	482	2,079,730.70	16.07	69,324.36
May	488	2,081,103.73	15.74	67,132.38
June	481	2,073,359.39	16.04	69,111.98
July	456	1,999,105.18	14.71	64,487.26
August	473	2,051,540.28	15.26	66,178.71
September	466	2,045,440.82	15.53	68,181.36
Total, 9 mos., calendar year 1936	4,296	$18,595,380.86	15.74	$68,114.94
Total, 9 mos., calendar year 1935	3,734	16,663,102.50	13.68	61,037.01
Total, 9 mos., calendar year 1934	3,963	18,169,914.85	14.52	66,556.46

Table showing trends in growth of transits through the Panama Canal.

Netherland India. Although exports of sisal from Netherland India during the first five months of 1936, totaling 31,000 tons, were 4,000 tons under the corresponding 1935 figure, it is believed in trade circles that the aggregate 1936 production will exceed that of 1935.

Approximately 75 per cent of the sisal is produced on the large estates devoted to the cultivation of this fiber, and the favorable price is stimulating this production.

American motion pictures have registered an appreciable advance in Netherland India during the current year. Official statistics show that during the first six months of 1936 American films accounted for 59 per cent of total film imports into that market, a ratio which compares with 48 per cent in the first half of 1935.

Imports of German films decreased markedly, French and British films gained slightly, while a very sharp drop occurred in imports of films from the Netherlands.

Java's 1936 rice crop will apparently be the largest ever produced in that country.

The provisional estimate places the 1936 yield of irrigated rice at 7,270,000 metric tons; the actual crop will probably exceed 7,300,000 metric tons.

The actual returns from the harvested area during the first six months of 1936 amounted to 5,300,000 metric tons of dry padi, an increase of 50,000 tons over the returns during the corresponding period of 1935 despite the fact that the area harvested was 85,750 acres less than last year.

The returns of the 1936 non-irrigated rice crop (padigogo) has been provisionally placed at 510,000 metric tons, or 30,000 tons more than the returns from the 1935 crop.

Exports of teakwood from Netherland India registered a substantial increase in the first half of this year, compared with the corresponding period of 1935. Shipments abroad advanced from 2,109 tons, valued at $120,000, in the January-June period of 1935, to 3,151 tons, valued at $200,000, in the first six months of 1936. The increased exports in 1936, the report states, were due to augmented shipments of rough lumber and sawn timber, as there was a decline in log and railway tie exports.

Peach Pacts. A large proportion of the 55 million dollar peach crop of the United States is grown in California, so California foreign traders should be interested in the following concessions for various peach products resulting from the international trade agreements recently negotiated by the State Department. Practically the same concessions apply also on apricot products, which are almost 100 per cent produced in California.

Belgium reduced the duty on dried peaches by 51.7 per cent, and on both canned peaches and on canned fruits for salad by 27.5 per cent.

Brazil agreed not to levy a duty on fresh peaches during the life of the agreement, and reduced the duty on canned peaches and canned fruits for salad by 20 per cent.

Colombia reduced by 50 per cent the present duty on peaches, whether fresh, dried, or canned, and granted a 50 per cent reduction in the duty on canned fruits for salad.

Cuba bound the existing duty on fresh peaches, reduced the duty on dried peaches by 12.5 per cent, and reduced the duty on canned peaches and canned fruits for salad by 16.7 per cent.

Finland has agreed to reduce the duty on dried peaches and dried mixed fruits by 50 per cent, and to reduce the duty on canned peaches and canned fruits for salad by 35 per cent.

France has given assurance against increases in duties on dried peaches.

Guatemala bound against increase the existing duties on canned fruits for salad, and imports of peaches, whether fresh, dried or canned.

Haiti agreed to a reduction of 35 per cent in the duty on canned peaches and canned fruits for salad.

Honduras reduced the duty on canned peaches and canned fruits for salad by 73 per cent, and also reduced the duty on dried peaches.

The Netherlands bound against increase the Netherlands import duties and monopoly fees on both canned peaches and canned fruits for salad, and bound the Netherland Indies rates on both canned and dried fruits.

Nicaragua agreed to reduce the duty on canned peaches and canned fruits for salad by 33 per cent, and to reduce the duty on dried peaches by 40 per cent.

Sweden bound on the free list dried peaches and dried fruits for salad, and reduced the duty on canned peaches and canned fruits for salad by 33-1/3 per cent.

Switzerland reduced the duty on canned peaches and canned fruits for salad by 18.2 per cent.

Most important of all in point of volume, Canada waived the minimum specific duty and reduced the ad valorem duty on fresh peaches by 25 per cent, binding this lower rate against increase during the life of the agreement. The duty on canned peaches and canned fruits for salad was reduced by 20 per cent, the new rate being bound against increase during the life of the agreement. As a result of the extension to the United States of most-favored-foreign-nation treatment, the Canadian duty on dried peaches was reduced by 10 per cent.

A New Fire Resistant Canvas Duck

Another important industrial problem has been solved with the perfection of a new fire-resistant cotton duck which, even when exposed directly to fire, will not ignite. The new fabric is a product of the William E. Hooper & Sons Company, Philadelphia and Baltimore, who devoted more than ten years to research in perfecting the fire-resistant qualities of the finish.

"Fire Chief," as both the treated fabric and the finish itself are known, offers a unique advantage over other methods of "fireproofing" fabric in the fact that its fire-resisting properties are impervious to the action of water or the elements. In addition, the new finish waterproofs the fabric, makes it mildew-resistant, and adds materially to its life.

These products are available either as finished fabrics under any of the familiar Hooperwood brands of cotton duck, which are all produced and finished in the Hooper Mills at Baltimore, or as a separate finish known as "Hooperwood Fire Chief Compound." The compound is shipped in cans and drums and can be applied either by painting or spraying, to any type of cotton duck. Tests have shown that, when "Fire Chief" compound is applied to old covers, it not only improves their appearance, but also adds appreciably to their life.

Obviously there are many applications both for the finished fire-resistant fabric and for the "Fire Chief" Compound.

A Pacific Coast steamer at an Asiatic Port.

Progress in Marine Boilers

Some Comments on the Developments in Design, with Particular Reference to Foster-Wheeler Water Tube Boilers

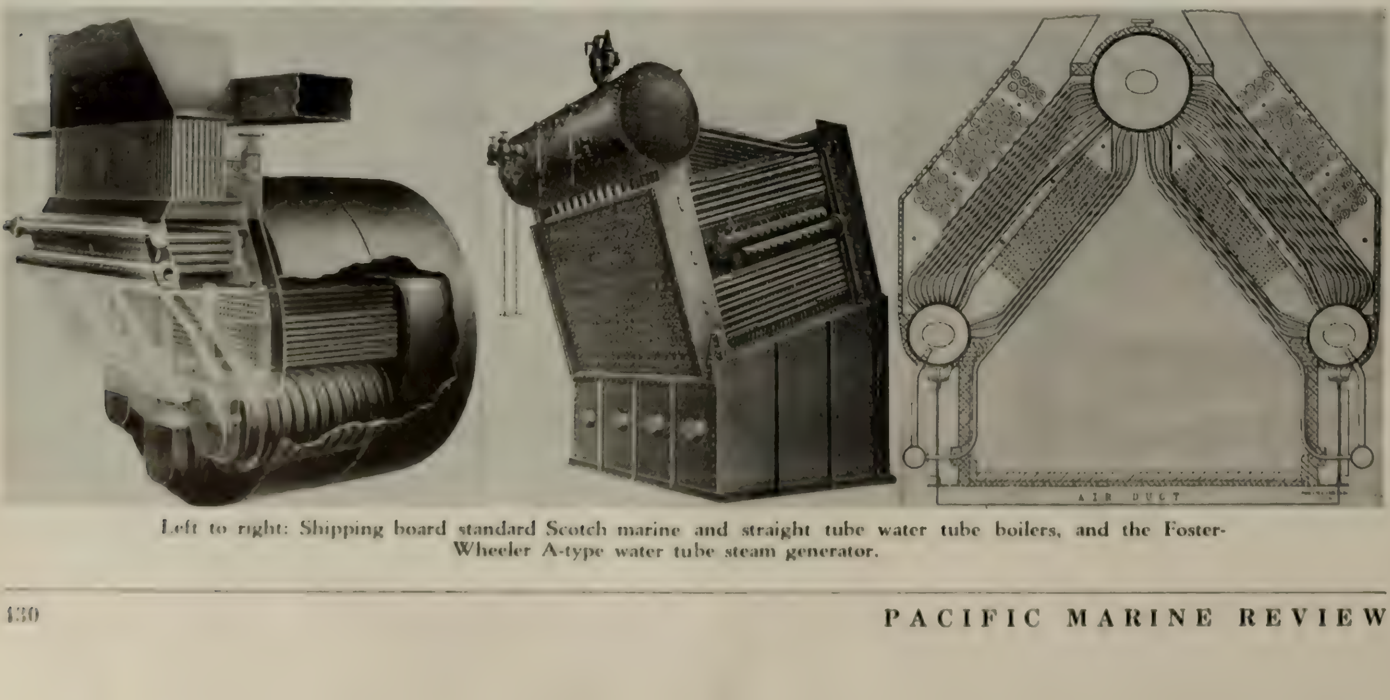
Many changes in marine power plant equipment occurred at or about the time of the war, and such definite progress has been made in marine boilers since 1914 that marine boiler history of the last 22 years has more bearing upon the future marine steam generator than all of the boiler history prior to 1914.

It is true that even prior to the war the marine operators of our Pacific Coast were actively engaged in the application of advanced ideas in marine steam boilers. Before 1900 the Union Iron Works at San Francisco were building water tube boilers for ships of the United States Navy. During the first decade of this century considerable attention was given to the burning of oil under marine boilers, and this led to several water tube boiler designs. In 1907 there were four types of marine water tube boilers advertising in Pacific Marine Review, and by 1912 there were seven different makes. During those years quite a number of steam schooners, fire boats, dredgers, and passenger vessels were equipped with water tube boilers. In comparison with the modern water tube boiler these designs were rather crude, but nevertheless some of them record remarkable efficiencies and space saving economies in comparison with the cylindrical fire tube type.

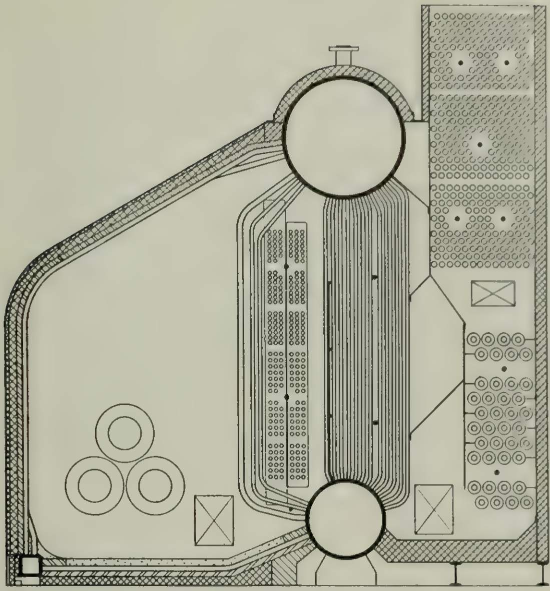
The war demand for marine boilers far exceeded our capacity to produce cylindrical fire tube boilers of large size and reasonably high pressure. Less material was required for water tube boilers and the time of construction was very much less for a standardized boiler of equal capacity.

To meet the emergency, the government was obliged to place orders for large quantities of "standard" water tube boilers. Typical among these was the design of the Standard Shipping Board boiler, having 3050 square feet of heating surface, box headers, straight tubes, a single cross drum, and rather simple steel casing. The boiler was carefully designed so that it could be fabricated by any reasonably well equipped boiler shop, and contracts were let throughout the country. Provision was made for the application of a "standard superheater" of extended surface, armored construction in order that superheated steam might be available when desired.

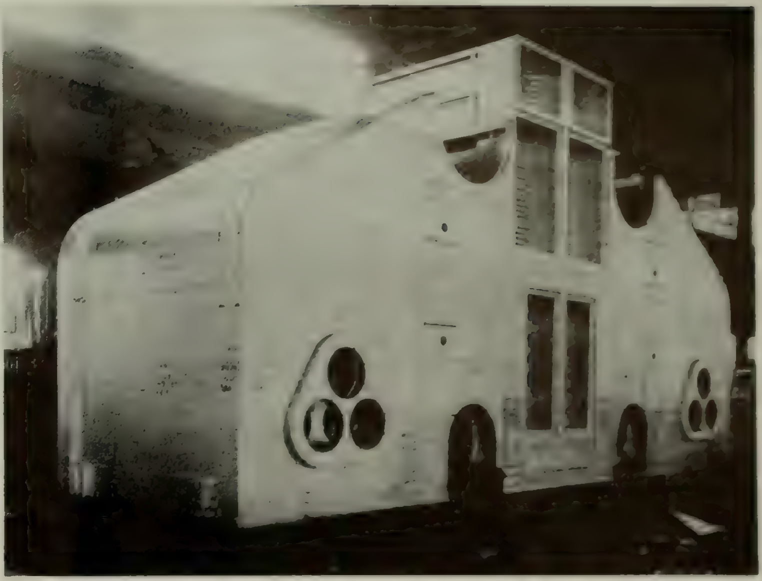
The first of these boilers was thoroughly tested before any were placed aboard ship, and its unusual arrangement of sheet steel baffles was established for both coal and oil burning. The elimination of brick baffles was of great advantage in the construction and assembly of a boiler when speed was an essential and the demands upon the producers of refractories already excessive. Under carefully conducted tests the efficiency of this boiler, with oil fuel, exceeded 81 per cent, and with coal fuel, 76 per cent. The CO_2 with coal firing was about 11.5 per cent, and with oil firing exceeded 13 per cent. It should be borne in mind that these boilers were not fitted with heat recovery equipment, (either economizers or air heaters) but the stack gases with coal fuel were from 460 degrees to 500 degrees, and with oil, 450 degrees to 600 degrees F. Many of these boilers are still in operation, and are giving remarkably good results considering the fact that they were rushed out as war emergencies.



Left to right: Shipping board standard Scotch marine and straight tube water tube boilers, and the Foster-Wheeler A-type water tube steam generator.



"D" type marine steam generator now being fabricated with welded drums. Each unit has a total heating surface of 1,830 square feet, including 780 square foot economizer and 1,300 square foot air heater Steam pressure is 430 lb. per square inch; temperature 750 deg. F



Shop assembly of casing for two "D"-type Foster Wheeler steam generators placed back to back.

The construction of ships fell to the zero point when the great number of bottoms necessary for war services were released from operation and tied up. Marine boiler manufacturers were faced with practically no demand for their product, and the few orders placed attracted the maximum of engineering thought; also the development of lessons learned with the large number of ships handled by inexperienced crews during the war. Then a fundamental step was taken. The feed water economizer, which had proved effective in stationary work, was introduced and successfully operated on river boats. It then spread to deep water. The first such economizers were applied to straight tube boilers and these made it possible to interest marine men in the next step—bent tube boilers. The advantages which a boiler—truly designed for marine work—could give, provided an experienced designer was allowed to incorporate the best features developed both ashore and afloat, began to be recognized.

Again the vessels of the inland waterways offered the most immediate opportunity. No surplus of bottoms for the inland waterways had resulted from war time activity, and the normal requirements for new river boats gave a field in which to demonstrate the advantages of: An adequate furnace volume, a bent tube boiler for high pressure, and waste heat recovery accomplished by means of an extended surface economizer. A two-drum boiler of these qualifications could be arranged with low head room and radiant superheater in the roof of the furnace. This gave a long, low boiler setting which worked well in the limitations of river boat practice.

The next step, and a perectly logical one, was to double such a boiler design by placing another water drum, and another bank of tubes, below the steam drum to form an "A"-type boiler, but with the firing done longitudinally of the drums instead of at right angles to them.

The first of these boilers was installed in a yacht and gave excellent results. Larger units, with water walls, superheaters and air-jacketed furnaces, were later applied to vessels of the Grace Line. Subsequently, similar boilers were ordered for tank steamers in considerable quantity, it having become obvious that the new high pressure, high temperature steam generator was, in reality, only a refinement of established boiler practice, using the same principles as the successful, two-drum boiler of the inland waterways.

No mention will be made here concerning developments of naval boilers, which are, of course, an entirely different problem and should not be confused with equipment for the merchant marine. The most recent of the merchant marine designs is a modification of the three drum, "A" type boiler referred to, and is known as "D" type. This identification is due to the fact that the boiler resembles the shape of a capital letter "D". Two drums are used, the steam drum being placed above the water drum and connected with it by banks of circulating tubes. An oil fired furnace is built at one side of the tube bank and is completely water cooled as to floor, side wall and roof.

A typical "D" type boiler is shown in the accompanying drawing, and it will be seen that space for a convection superheater is arranged behind the third row of boiler tubes. An economizer, followed by a tubular air-heater, recovers heat from the stack gases and provides a highly efficient, yet light and compact, construction.

These "D" type marine steam generators were first used for two tankers built by the Federal Shipbuilding and Drydock Company and sold to the Standard Oil Company of New Jersey. A single steel casing houses two units, and they are capable of providing all the steam requirements of the 3000 shaft horsepower tanker. The light weight and compactness made it possible to place the boiler room above and aft of the main turbine, thus releasing valuable space for cargo. The performance of these two vessels was so satisfactory that eight additional new tankers have since been ordered, fitted with "D"-type boilers.

Thus we see that marine steam generator developments since the war have proceeded through a considerable cycle, and, whereas a sin-

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Modernizing a Fireboat

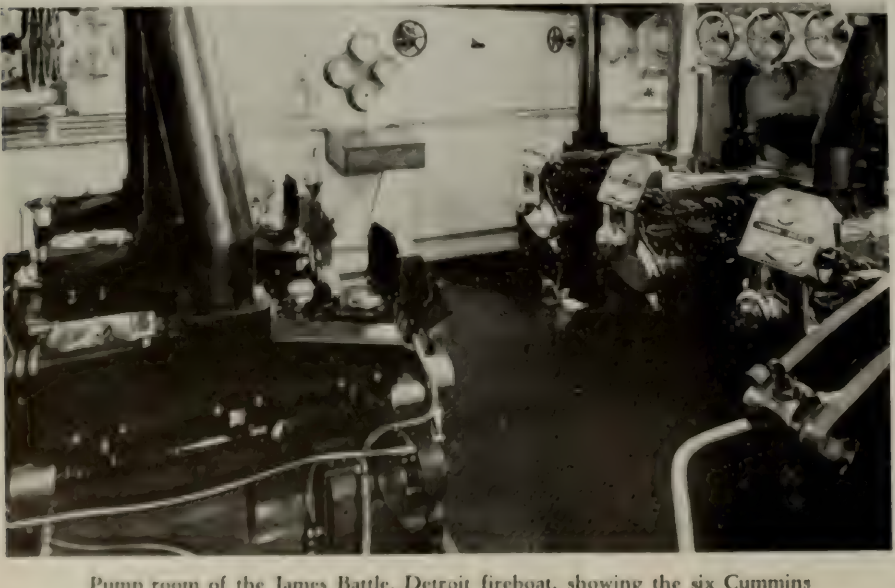
Detroit Peps Up a 36 Year Old River-Going Fire Fighter by Installing a Diesel Driven Pumping Plant

Thirty-six years ago there was built a powerful, steam powered vessel measuring 125 feet x 25 feet x 13 feet, at Wyandotte, Michigan. For 35 years this vessel performed commendable work as one of the most powerful fireboats located on the Great Lakes—as a unit of the Detroit Fire Department. But its usefulness was diminishing because the fire fighting requirements of Detroit's waterfront have increased during these years.

For some while those in charge of the fireboat had considered ways and means of increasing the pumping capacity of the faithful James Battle. New and larger boilers were one alternative — an entirely new vessel to replace the James Battle was another. The first was only a compromise because it would be expensive and also require changing the steam driven pumps. The plan to build a new vessel could hardly be considered because of the lack of funds.

The ultimate decision was to remove the two steam pumping units and replace them with diesel engines direct connected to multi-stage pumps. This arrangement would allow all of the boiler capacity in steam to be delivered to the propelling engine—an 1160 I.H.P. compound, and so make for better speed in answering fire alarms.

Investigation of diesel powered fireboats was focused on the City of Portland, owned by Portland, Maine. This vessel, built in 1930, has five Cummins, six cylinder, 190 H.P. diesels. She is triple screw with the center propulsion engine coupled only to its propeller—and the two wing engines coupled to propellers and to pumps. All 3 engines are single direction units equipped with reverse gears. This permitted the installation of one way clutches off the forward ends of the shafts of the two wing engines. The two additional engines are forward of the propelling-pumping units and are direct connected to pumps. So successful has been the City of Portland, at Portland, Maine, that the Detroit officials concluded a contract with the Cummins Engine Co. for the diesels to be installed in the James Battle.



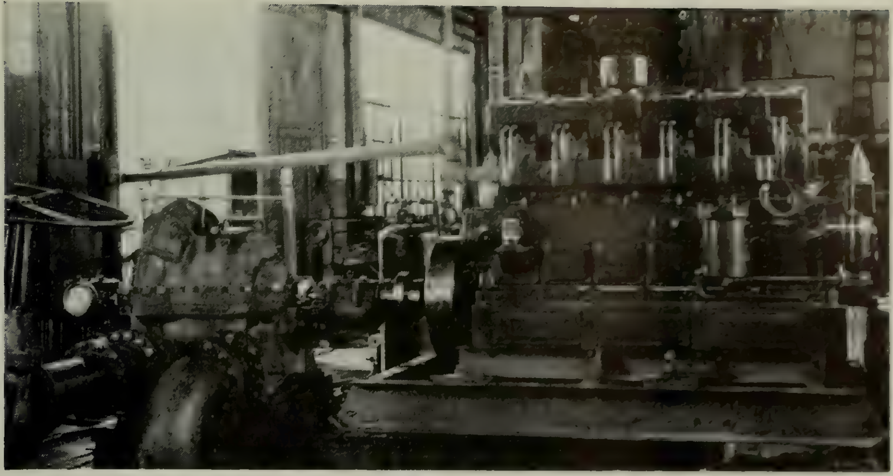
Pump room of the James Battle, Detroit fireboat, showing the six Cummins diesel pumping units.

Six Cummins engines of the HB-MR-6 type were ordered to direct drive six Seagrave four stage centrifugal pumps. The pumps specified are of all bronze construction. The single stainless steel shaft in each pump carries two double impellers of the diffusion vane type. They are designed for a maximum of 400 pounds per square inch pressure. Governors on the engines were set at 2000 r.p.m., at which point approximately 165 horsepower could be developed.

Performance tests made at the Seagrave Corp. in Columbus, Ohio, included tests at five different line pressures covering endurances from ¼ hour to 2 hours, in order to determine the efficiencies of the engines and pumps. At 120 pounds nozzle pressure the average delivery per minute was 1370 gallons for each of the six pumping units. When the pressures were raised to 200 pounds the delivery was 959 gallons per minute. In the Fire Underwriters tests the Cummins powered pumps exceeded the minimum performance guarantee by 9.4 per cent, while the maximum excess performance was 41.4 per cent. The minimum average for all six units was 11.0 per cent, and the maximum average was 29.1 per cent. This gives a general average excess performance of 16.8 per cent. A total of 8220 gallons per minute at 125 pounds pressure are available from the six units.

During these tests there was a 4-foot suction head on the pumps, while the installation when completed gave the pumps a slight pressure head at the pump intake. Had the elaborate tests made at the Seagrave factory been repeated after the units were installed, it is obvious that an even larger excess performance would have been recorded.

The six Cummins engines are mounted thwartship on foundations running fore and aft. Flywheel ends



A Cummins diesel and a Dean-Hill pump set up in the shop for tests.

of the engine are outboard with the pumps between the engines and the hull. Three units are on each side. Due to the compact design of the Cummins diesels, mounting them thwartship still leaves an abundance of room between the control stands on the units. The beam of the ship at this point is approximately 24 feet. The main steam propulsion engine is just forward of the diesel pumping units.

### ● Cummins Diesel Features

Special chrome plated instrument panels are mounted on the front ends of each engine. They serve a dual purpose of housing the drive to the engines' circulating water pumps, and providing complete control over the engines. The instrument boards carry the electric starter switch to engage the 24-volt starting motor, the fuel priming pump, a lubricating oil pressure gage, cooling water temperature gage, fuel oil pressure gage, and a hydraulic pressure gage from the fire pump discharge.

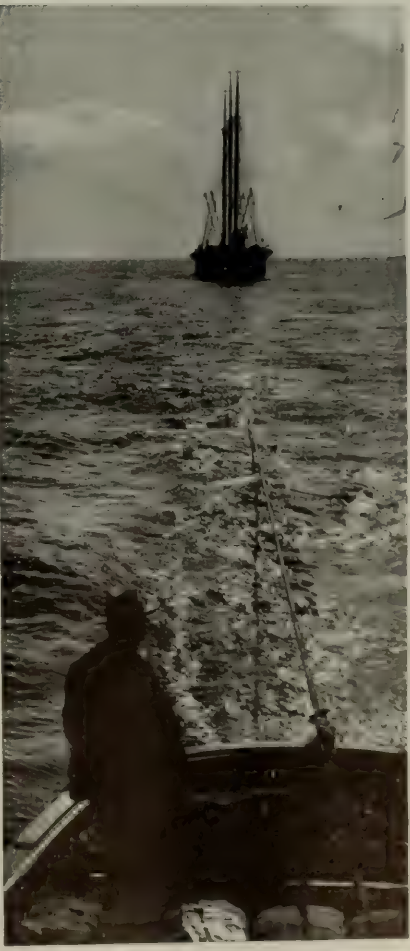
On the right side of each panel is the governor control. The speed of all Cummins diesels is controlled from a sensitive centrifugal governor which actuates the quantity of fuel delivered to the injectors.

Standard Cummins manifolds of the water cooled type are used, sheathed by a copper manifold surrounding the engine manifold. This sheathing tends to reduce the radiated heat. Individual exhaust stacks extend above the boat deck approximately five feet.

A 24-volt starting system obtains current from a common storage battery serving all the engines. Instant starting is thus possible, and within 10 seconds all of the six engines can be put into operation.

The exclusive Cummins low pressure fuel injection system features a single pump that delivers the correct volume of fuel to a distributor disc which in turn delivers the fuel to the firing cylinder.

The modernized James Battle has now been in service a number of months and is acclaimed an outstanding success. It should lead the way for other cities whose fireboats are generally in need of increased capacity because of their age. The entire cost of the changeover was paid for from the regular maintenance fund, and required no special appropriation to finance it. Considerable credit is due the Fire Commissioners of Detroit, and to the Cummins Engine Co. for the commendable manner in which all details were executed.



As this is being written, the Cummins factory is building five larger diesel engines for the City of Chicago's new fireboat. Plans for this vessel were completed this summer and it is expected that she will be in service by winter. This vessel will be the largest all diesel fireboat in the world. She is now being built by the Defoe Boat and Motor Works, and will be powered by five 250-horsepower 7-inch x 10-inch Cummins diesels and a Cummins 30-kilowatt generating unit. Dean-Hill pumps will be coupled to four of the 250-horsepower engines.

Modern Marine Boiler Progress

(Continued from Page 431)

gle drum, horizontal tube, small furnace boiler was regarded as radical in design by many marine operators at that time, we have now arrived at high pressure, multi-drum steam generators with assured circulation, water-cooled furnaces and heat recovery equipment adequate to maintain efficiency in spite of the increased water temperature in the boiler due to higher pressure. The end, of course, is not yet in sight and although marine boiler efficiencies are coming close to 90 per cent in regular service, it will be possible to arrange for higher steam temperatures, more precise control of superheat, and other modifications that will continue to reduce the fuel per shaft horsepower necessary to propel the steamer.

. . . Observed at

Los Angeles Harbor

● Strike Losses

"There are approximately 40 cargo ships tied up at Los Angeles-Long Beach harbors as a result of the maritime strike. Eight of these ships are of foreign lines with an estimated total of 24,000 tons valued at $50 per ton on board. The total valuation of cargo on these ships is about $1,200,000. This cargo, destined for all Pacific ports, including much to be discharged here, is raw material needed for local manufacturing plants and industries. Failure to get this cargo will slow down production and may shortly cause layoff of many men and women, thus adding to the unemployment. Much of this cargo is perishable and may be lost if it is not unloaded without further delay."

Since the above was written, these losses have been mounting daily to new highs and the end is not in sight.

● Bulk Oil Shipments

Bulk petroleum shipments from Los Angeles harbor during the week ending October 2 totaled 1,184,035 barrels, a slight decrease under the totals for the previous week, it was reported by the Chamber of Commerce Marine Exchange. Of this total 584,449 barrels were consigned to Pacific domestic ports, 451,386 barrels to Pacific foreign ports, 132,600 barrels to Atlantic domestic ports, and 51,600 barrels to Atlantic foreign ports.

For the week ending October 17, bulk oil shipments totaled 910,315 barrels, more than 350,000 barrels less than the total for the previous week. There were no shipments for the second successive week through the Panama Canal to Atlantic domestic and foreign ports, all petroleum being consigned to Pacific ports for a total of 598,682 barrels, domestic, and 311,633 barrels, foreign.

● Towboat Taxes

A case of unusual interest to shipowners was decided by Superior Judge Emmet H. Wilson, Los Angeles, October 2, when he held that registered vessels were assessable in the county in which the port of registry was situated, and not in the county in which the vessels were habitually moored or anchored. The decision was made in an action brought by Shipowners and Merchants Tug Company, Ltd., and Crowley Launch and Tug Boat Company, against the County of Los Angeles to restrain the assessment of tugboats registered at the port of San Francisco that have operated in Los Angeles harbor for several years.

Los Angeles Harbor thirty years ago was largely a haven for lumber schooners. Its growth to its present position as one of the principal ports in America is one of the wonders of modern business.

● Foregn Trade Gain and Drop

Foreign trade of Los Angeles custom district registered a gain of 45 per cent for September, 1936, as compared with the same month last year. The total value for that month this year was $14,244,573, and the volume 518,786 tons, while for 1935 the comparative figures were $10,032,814 and 356,863 tons. September surpassed August by over $300,000. During the 31 days of October this trade dropped to 366,039 tons, having a total value of $11,446,529.

● Harbor Commission

At its October 21 meeting, the Board of Harbor Commissioners of the City of Los Angeles approved several building improvements on docks of nominal value; the purchase of a radial drill for $5515.00 from the Smith Booth Usher Company; and the granting to the Los Angeles Yacht Club of a use-permit for the same waters and lands now occupied by them, for a term ending February 15, 1941, the grantee to expend $12,000 for the installation of anchorage morings and to pay $50.00 per annum for the first 50 anchorages and $1.00 per month for each anchorage above said 50.

● Citrus Fruits

The navel orange crop of Southern California is estimated by the California Fruitgrowers Exchange to approximate 15,000,000 boxes, or practically equal to the crop of last season. The same authority predicts a crop of 4,373,000 boxes of grapefruit from the groves of California and Arizona. The California Fruit Growers Exchange has sent Carl R. Greenburg as a special representative for survey and citrus fruit sales promotion work in Asia.

● Cotton Crop

The Cotton Association of Los Angeles predicts a record-breaking production for the California-Arizona cotton crop this year. The estimated figures are 160,000 bales, valued at $13,000,000, which, if correct, will make an increase of 28.7 per cent over last year and a 5,000 bale increase over the previous peak year, 1930.

● Maritime Bureaus Centralize

On completion of the new Federal Building at Eighth and Beacon Streets, San Pedro, recently, offices were rapidly being moved to the central location. Federal maritime boards are now located in the new quarters.

The maritime offices to be housed in the new structure include: Bureau of Fisheries, Hydrographic Office, Shipping Commissioner, Customs Service, Bureau of Maritime Inspection and Navigation, Internal Revenue Service, Naval Radio Reserve, Naval Dispensary, Public Health Service, Employers' Compensation Commission, and the Lighthouse Service.

● Tenth Anniversary

On November 1 the Los Angeles office of the Furness Line (now Furness Pacific Ltd.) celebrated its tenth birthday. R. V. Ross, present district manager, opened this office and has served continuously as its manager. The office is Los Angeles cargo representative for the Holland America Line, the Royal Mail Line, the Prince Line, and the Silver Line, so that this agency has normally a sailing for Europe each week.

● Course in Foreign Trade

G. A. Glasscock, of the Department of Foreign Commerce and Shipping of the Chamber of Comerce, is conducting an interesting class in Foreign Trade every Tuesday and Thursday, 7 to 9 P.M., at the Polytechnic Evening High School, 400 West Washington Street, Los Angeles.

This is the first time such a course in practical foreign trade has been offered by the evening high schools and it is proving very popular.

Mr. Glasscock has had thirty years' experience in foreign trade activities and brings a wealth of first hand information to the students.

Since seventy-five per cent of all manufacturers, all steamship lines, exporters, importers, export and import brokers, buyers for foreign firms, indent agents, custom-house brokers, trucking line operators and others are engaged in foreign trade there is a real need for such a class.

New Handy Paint Gun

Shipyard superintendents and marine officials generally, whose problems include repainting operations, will be interested in a low-cost, efficient paint spray outfit including a small air compressor, a spray gun and the necessary hose and nozzle connections.

Saylor-Beall paint spray gun.

The new Saylor-Beall spray gun combines both internal and external atomizing nozzles, a feature which makes it available for all the various jobs it is called upon to do in shipyards and on board ships.

Low pressure internal atomizing is the most economical system for applying most liquids because such nozzles give the greatest coverage per cubic foot of air used. On the other hand some materials, like the new fast drying lacquers, must be atomized after they leave the gun. The Saylor-Beall gun can be quickly changed to handle such materials, and results in an all-purpose spray at a minimum investment.

The Saylor-Beall Manufacturing Co., Detroit, Michigan, are introducing this new gun.

A Busy Baltimore Shipyard

Four marine building and repair orders, totaling more than $1,525,000, are reported by the Koppers Company subsidiary, The Maryland Drydock Company.

The company has earned its preferred dividend every year except one during the depression, according to George E. Probest, Jr., president, who predicts that there is an accumulation of shipping work which will provide a steady flow of business for several years to come.

The first all-fireproof passenger ship in service will be delivered by this company when it completes reconditioning now under way on the Catherine for A. H. Bull and Company. The fireproofing construction is the result of tests made by the U. S. Senate Committee investigating the fireproofing of vessels, and the Bureau of Marine Inspection and Navigation of the Department of Commerce.

An order for three railroad car floats for the Pennsylvania Railroad at New York has just been received, and the company recently launched a new 175-foot auto ferry of its own construction for Norfolk County, Virginia. It will be put in service between Norfolk and Portsmouth, Virginia.

The company has completed rebuilding two 360-foot cargo ships and building three new 130-foot covered lighters for the Merchants and Miners Transportation Company. The ships were formerly in deep sea trade and have been rebuilt for coastwise passenger and cargo service.

An Unusual Launching

When the trawler Swell was launched at Bath Iron Works yard, Bath, Maine, on October 17, she provided an interesting departure from the usual launching of new ships. The Swell was complete in every detail at the time she slid into the water, and was thus enabled to return to her wharf under her own power. Delivery of the vessel was made on the following day.

In sailing ship days the ship was sometimes launched complete with sailors on the yards ready to unfurl canvas.

Port of Portland Notes

● Strike

The maritime strike found 22 American cargo ships and six foreign vessels in the Columbia River district, tying up all of the former and forcing the others to go elsewhere for cargo. The first two weeks were exceptionally quiet in Portland, with representatives of the maritime unions picketing North Front Avenue and the other cargo dock areas, and steamship operators and agents cleaning up their work in their uptown offices.

American vessels strikebound here were the following: Alaskan and Floridian, American-Hawaiian Steamship Company; California and Illinois, States Steamship Company; San Felipe, Quaker Line; Calmar and Portmar, Calmar Line; Charles L. Wheeler, Jr., Sidney M. Hauptman, Nabesna, and Point San Pablo, McCormick Steamship Company; Cornelia and Whitney Olson, Olson Line; Cricket, Owens-Park Lumber Company; Eureka, Watsonville and Point Loma, Christenson-Hammond Line; Harry Luckenbach, Lena Luckenbach, Lewis Luckenbach, Luckenbach Steamship Company; Point Estero and Point Vincente, Swayne & Hoyt, Ltd.

Foreign vessels in the river when the strike was called were: California Express, Brazilian Reefer, Lochmonar, Getsuyo Maru, Tempei Maru, and Gyokoh Maru. The Nordpol and Yayoi Maru arrived on November 14 after the others had all departed.

Previous to the coastwide strike, two crews in the Columbia River district had struck, demanding guarantees of transportation in case their vessels were strikebound in distant harbors. The crew of the Oregon, Bulk Carriers Corporation steamer, also asked changes in their quarters, some of which were made and some promised by the company at the next drydocking. The vessel departed October 21 for Gulf ports. The other crew was that of the Christenson-Hammond steamer Watsonville, which left the ship the day before the big strike opened.

● A Cryptic Address

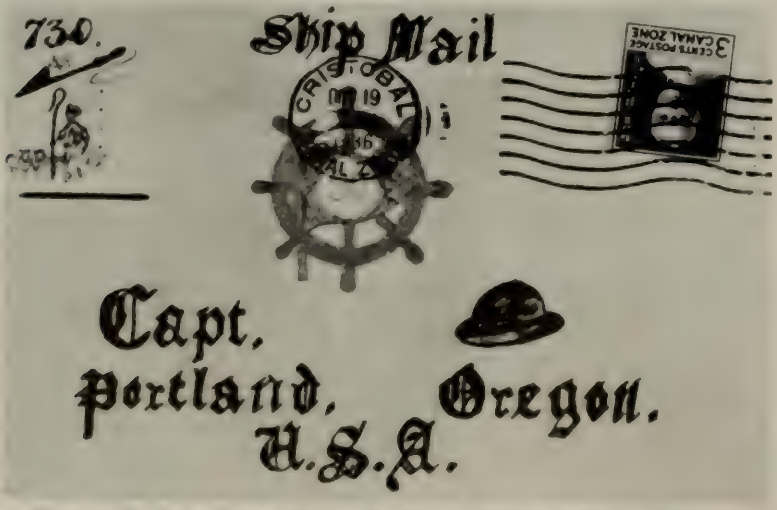
When a letter was received at the Portland post office with the drawing of a black derby preceded by the word "Capt." where the name of the addressee should be, it did not take Uncle Sam's mail carriers long to figure out to whom it should go.

Somebody understood the blue and gold insignia of the Masters, Mates & Pilots, which had been painstakingly painted upon the face of the envelope, and delivered the letter to the association's local office. There the black derby suggested but one person: J. L. "Hard Hat" Jacobsen, independent Columbia River pilot, who prefers his black topper to any other when he is piloting ships up and down the river.

And Hard Hat Jake had little difficulty figuring out who sent him the strange letter before he opened it. In the upper left hand corner was the number "730", which, according to the masters, mates and pilots directory, was none other than Lee Marshall, second mate. The ship's name was designated by the drawing of a harpoon (Harpoon, that's it), with the figure of a shepherd and his flock, and a plain, simple black line below (representing the Shepard Line).

Easy, isn't it, Mr. Ripley?

The letter had been mailed at Cristobal, Panama, Canal Zone.



Photograph of envelope with cryptic address, which was delivered without difficulty by the Portland post office.

● Umpqua Jetty

Contract for the extension of the Umpqua River south jetty about 1800 feet beyond its present outer end at a cost of $929,405 has been let to Kern & Kibbe, Portland contracting firm, by the United States engineer corps, 1st Portland district.

The firm's bid was the only one received, but was $20,000 below the Engineers' estimate. The work will include placing of 500,000 cubic yards of stone, some railroad construction, placing of an asphaltic cement cap over the outer end of the extension to keep it from wearing away, and some minor repairs.

● Deep Sea Trade

Portland's deep-sea cargo tonnage during the first ten months of 1936 was ten per cent greater than during the corresponding period of 1935, according to Portland Merchants Exchange statistics. Excluding coastwise shipments, figures for which are withheld by the members of the coastwise conference, the port had a total cargo tonnage of 1,348,779 tons pass over its docks this year, compared with 1,219,377 tons last year.

Petroleum receipts, which account for the largest single item of tonnage, have gained heavily over last year, according to estimates gained from state gasoline tax figures, which show a 20 per cent gain.

While the maritime strike had not at this writing interrupted petroleum receipts, it had halted all other cargo movement with a resultant effect upon the year's tonnage figures.

● Terminal Expansion

Municipal Terminal No. 1, at Portland, is to be remodeled and enlarged at a cost of about $868,000 during the coming year, according to plans announced by the Portland Commission of Public Docks and the WPA. The WPA announced allotment of 45 per cent, or $391,040, toward the cost of the project.

The proposed improvement will include widening the apron along the face of the quay dock to a width of 30 feet and construction of two railroad tracks along it for the spotting of more than 40 cars at shipside, according to A. D. Merrill, chief engineer of the dock commission.

An open dock 325 feet wide and 381 feet deep will be built over the former American Can Company property, between this terminal and the old Admiral Line terminal. Railroad tracks to the quay will cross over this open dock.

A new warehouse, 200 feet square, widening the present warehouse, reconstruction of the 60-foot apron along the slip, and abandonment of the lower level of the quay dock are also proposed.

Completed, the quay dock and pier 1 will have an overall length of 1285 feet and width averaging about 435 feet, virtually doubling the floor space of the present terminal.

Construction is expected to start early in 1937.

● New Coastwise Service

Prospects of a new coastwise steamship service originating in Portland were seen in the filing at Salem of incorporation papers for the "Coastwise Line." Alfred A. Hampson, of the legal firm of Dey, Hampson & Nelson, who filed the papers, refused to reveal the names of the organizers. The names of three members of his office staff were on the papers.

Steamship men speculating on the matter felt the service may be contemplated by the Crown-Willamette Paper Company to replace the service lost to that firm when the Pacific Steamship Lines suspended.

● Port Personals

Captain Jens H. Jensen and the 20 members of the crew of the lighthouse service tender Rose have received official commendation from Secretary of Commerce Roper for their bravery and heroism in removing 350 refugees from the dangers of the fire that destroyed the town of Bandon, Oregon, September 27. The commendation was in the form of a personal letter from the Secretary to Captain Jensen, delivered through **E. C. Merrill,** district lighthouse superintendent.

Portland Dock Operators Association will continue to function despite a move toward disbandment. Decision to continue was made at a recent meeting, at which it was pointed out that several coastwise lines had gone out of business during the last year, but there still remained some functions for the association, which is composed of coastwise lines operating their own docks.

R. W. Cook, of American-Hawaiian Steamship Company, was elected to the executive committee, succeeding **C. "Jack" Ballard,** of Pacific Steamship Lines. Other members of the committee are: **Charles Spear,** Interstate Terminals, Ltd.; **C. E. Collins,** McCormick Steamship Company; **Alvin York,** Supple's dock; and **P. H. Carroll,** Commission of Public Docks.

Portland Chapter, Propeller Club of the United States, postponed its charter-presentation dinner meeting from November 19 until December 3 so that **Governor Martin,** of Oregon, and **Mayor Carson,** of Portland, could attend. **Captain F. E. Lovejoy,** Seattle, northwest regional vice president of the national organization, received the Portland club's charter and was scheduled to make the official presentation. About 50 charter members had been signed up, according to **K. C. Conyers,** president.

● Wheat for Export

Port of Vancouver, Washington's big grain elevator, has been the Pacific Northwest's most active wheat-loading dock during the current cereal year, loading approximately 4,000,000 bushels prior to the close of operations by the maritime strike.

One of the largest shipments of the season was 6800 tons loaded by the Danish motorship Chr. Sass, which departed for Ireland two days before the strike opened. Upon the day of the strike, the Japanese steamer Tempei Maru berthed at the elevator to load 6500 tons, but was forced to leave the grain in the elevator and depart after two weeks of idleness. This would have been the first large parcel of wheat shipped from the Columbia River to Japan this year.

● An Old Breton Seaman

Long after most men would have either retired or been worn down by the worries of seafaring, Captain Louis Laverge is still going strong as the master of the American-Hawaiian steamer Iowan. For 62 years he has been going to sea, and 42 years of it have been spent on the bridge of one ship or another. For 14 years he has been on the Iowan, running the intercoastal route be-

(Page 439 Please)

Seattle Shipping Briefs

Many a Seattle halibut schooner has sailed into "midnight sun" seas.

● M. S. Boxer Works Cargo

The little motorship Boxer, of the United States Bureau of Indian Affairs, was a favored vessel on the waterfront in Seattle when she arrived recently after a long Alaska cruise. While overseas and intercoastal ships were idle because of the strike, the Boxer worked cargo and discharged shipments of reindeer hides and ivory, owned by natives of Alaska. All Government vessels are being worked.

● Pilot Builds Fishing Boat

Pilot Frank Anderline of United Air Lines, who is an enthusiastic yachtsman and fisherman and knows boats as well as airplanes, was host at a launching November 3 at the plant of the W. J. Schertzer Boat and Engine Works on Lake Union. Pilot Anderline's third craft was sent down the ways with appropriate ceremonies. The new vessel, a sport fishing boat, was christened Bromike, a contraction of the names of the Anderlines' dog and cat, Brownie and Mike.

Little Miss Patricia Helen May, three-year-old daughter of Luke May, Seattle criminologist, christened the Bromike. The new vessel will be able to maintain a speed of 25 miles an hour.

● Colman Dock Rebuilding

Bids received by the J. M. Colman Company for rebuilding historic Colman Dock on the Seattle waterfront have been taken under advisement. Tenders for the general contract were received from five firms: the A. W. Quist Company, the Henrikson-Alstrom Construction Company, Teufel & Carlson, the Puget Sound Bridge & Dredging Company, and the General Construction Company. Bids for heating, plumbing, electric work, and sprinkler system also have been received. Plans and specifications for the new terminal were prepared by Arthur Loveless and Lester Fey. The present structure back of the three-story building on Alaskan Way will be razed and a new pile wharf, and a dock of mill construction erected. There will be new executive and operating depart-

S.S. Victoria brings to Seattle over a million in gold bullion from Alaska. In the chests loading on the truck there is $800,000 worth.

ment offices for the Puget Sound Navigation Company, waiting rooms, and rental offices in the new terminal. The main entrance will be directly in line with the viaduct from First Avenue and Marion Street. The entrance tower, containing a modernistic clock, and the lower part of the present three-story building, will be faced with enameled steel, and the remainder of the street frontage with stucco. New store fronts on Alaska Way will be provided.

On the street level of the dock will be provided space for parking 175 automobiles, waiting for passage to the ferries. The main waiting room on the second floor will be 100 by 130 feet, with a 26-foot ceiling, and will be finished in maple.

● The Halibut Fleet

Seattle's huge halibut fleet has returned from the deep-sea banks and tied up in moorings on Salmon Bay and Lake Union until the next fishing season opens, March 15, 1937.

The 175 vessels, manned by 1,575 fishermen, brought 22,296,230 pounds of halibut to Seattle during the season, compared with 21,691,700 pounds the corresponding period in 1935, an increase of 604,530 pounds, according to figures compiled by Harold E. Lokken, manager of the Fishing Vessel Owners' Association.

The catches were valued at $1,970,943, compared with $1,793,512 in 1935, an increase of $177,431. The average price this year was 8.83 cents, compared with 8.27 cents last year. The fishing season opened March 15 and closed November 3.

The schooner Yakutat, Captain Anton Ness, brought the largest halibut landed in Seattle during the season. It was caught on the Western Alaska banks and weighed 325 pounds.

Although much heavy weather was experienced, no vessels were wrecked and no lives were lost during the season.

Fishermen are now separating hooks from ground lines and storing gear away until the fleet outfits for another season on the banks.

● Port Personals

D. W. Branch, general manager in Seattle for salmon operations for Libby, McNeill & Libby, has been retired after forty-four years of service with the firm. He is succeeded by **F. Svensson**, general superintendent.

Reconditioned S. S. Floridian, formerly Stuart Dollar.

Branch came to Seattle from Chicago, arriving here May 6, 1903. He saw the transition of the Alaska salmon fleets from picturesque sailing ships to modern steamships and motor vessels. From one cannery tender, Libby, McNeill & Libby floating equipment was developed to a fleet of 130 craft. Svensson has been in the service of Libby, McNeill & Libby twenty-four years.

Joseph C. Harper, recently appointed general freight agent in Seattle for the McCormick Steamship Company, is a former banker, who worked his way up from messenger to teller before casting his lot with a deep-sea shipping corporation operating services coastwise, intercoastal, and to South America. For six years Harper was employed by the Scandinavian American Bank in Seattle. He is a son of the late Frederick C. Harper, who was collector of customs for the Washington District from 1906 until 1915.

An Old Breton Seaman

(Continued from Page 437)

tween Boston, Massachusetts, and Portland, Oregon.

It is not often that Captain Laverge tells the story of his eventful life, but he was caught in a reminiscent mood in Portland and here it is, in brief;

At the age of 10, when most children are still buried in their elementary school books, young Louis left his home near Cherbourg, France, and became deck boy, cook and helper on a two-masted 80-foot Jersey cutter, which was engaged in transporting fresh eggs, vegetables and fruits across the English Channel to Cardiff, and taking coal back to Le Havre.

"I received the large pay of 10 francs ($2) a month, which I took home to my mother, the custom of those days," he said. "I thought I was rich when mother would let me keep a couple of sous for spending money. Then I would take my little brother and sister down to the shop for candy."

Two years later the lad graduated to the full-rigged American ship Success, which was running between New York and London. Another two years found him bounding around the Horn on the famous old British clipper Cutty Sark, which he joined in Sydney, Australia.

"That was a trip," he said. "Never a minute, it seemed, did any man have on a dry stitch of clothes. We made the trip in 80-odd days."

"I determined to leave sail and get into steam, along about 1890, but instead of steam, I went out to Duluth, Minnesota, and went to work as a rigger for a company building whaleback steamers for the Great Lakes."

After four years there, Laverge took his first command — just 42 years ago. He was made master of one of the whalebacks on which he had worked. In 1896 he was commander of the City of Everett, the largest whaleback operated on the Pacific Coast.

Throughout his whole eventful career, Captain Laverge has had but one accident, and that was not to his discredit.

Marine Insurance Review

What is an Able Bodied Seaman?

Maritime Inspection Bureau Issues Rules, Requirements and a Manual for the Certification of Seamen and Lifeboatmen

In several recent emergencies on American flag vessels, the official inquiries have uncovered a disgraceful lack of morale among officers and crew. This condition led Congress to enact the so-called Safety at Sea Law, which contains many provisions for checking up on the ability, experience, and efficiency of American seamen. We have already published a synopsis of this act and broadcast the imminence of its provisions. For many of these the dead line is December 25, 1936, unless the Secretary of Commerce decides to postpone, in which case it can be not later than March 25, 1937.

That the Bureau of Marine Inspection and Navigation is moving in this matter is proved by the October issue of its monthly "Bulletin," which sets forth the requirements for "Certificates of Service and Efficiency" for lifeboatmen and able seamen.

We reprint herewith the preamble and Part I of this manual. Part II, illustrated with excellent drawings, gives in considerable detail the information on which the examination for lifeboatmen will be based.

It will be noted that the requirements for certificate of service as able seaman are quite extensive. Many of our modern deck hands will need several months' training at one of the proposed Merchant Marine Academies.

● Manual for Lifeboatmen and Able Seamen

A manual for lifeboatmen and able seamen has been prepared by this Bureau with the object of rendering assistance to personnel serving in the American merchant marine in becoming better lifeboatmen and able seamen. The new regulations issued on the basis of recent legislation are also explained.

This manual has been divided into five parts, outlined below. Parts I and II, pertaining to lifeboatmen, are set forth in full in the October issue of the bulletin and parts III, IV, and V will be printed in the November issue.

Part I of the manual states the requirements to be met prior to examination for a certificate of efficiency as lifeboatman and for a certificate of service as able seaman. It also states the nature of the examinations themselves.

Part II concerns lifeboatmen. In it, lifeboats, life rafts, life floats, buoyant apparatus, davits, and releasing gear are described. Equipment required by law on lifeboats, life floats, and other buoyant apparatus on vessels in different services is listed, and general information of interest to lifeboatmen is included, as is also a series of questions and answers.

Part III concerns able seamen. It does not attempt to treat the subject of seamanship, but does include sections covering certain branches of seamanship which are important.

Part IV consists of a short statement outlining the provisions of new legislation requiring certificates of service and continuous discharge books.

Part V consists of a description of the prone-pressure method of resuscitation of the apparently drowned.

● Part I: Certificates

All certificates as "able seaman" and "lifeboatman" previously issued must be surrendered to boards of local inspectors by December 25, 1936, unless the time for surrender is extended by order of the Secretary of Commerce, who may in his discretion extend the time for a period not to exceed 3 months. New certificates will be issued by boards of local inspectors to any seaman or lifeboatman surrendering his old certificate if found to be qualified after suitable examination based upon the qualifications of the applicant. No lifeboatman will be considered a "certificated lifeboatman" unless he possesses one of the new "certificates of efficiency as lifeboatman", and no seaman will be considered an "able seaman" unless he possesses one of the new "certificates of service as able seaman."

● Certificate as Lifeboatman

An applicant for a certificate of efficiency as lifeboatman must have had not less than 12 months' service in the deck department, or 24 months' service in other departments on board vessels in ocean, lake, bay, or sound service. He must file application with a board of local inspectors for examination in the form prescribed by the regulations. He must appear personally before the board and prove to its satisfaction, both by an oral examination and also by an actual demonstration that he has been trained in all the operations connected with launching of lifeboats and life rafts, and the use of oars; that he is acquainted with the practical handling of the boats themselves; that he is capable of taking command of a boat's crew; and that he is capable of understanding and answering the orders relative to lifeboat service.

The oral examination will consist of a series of questions designed to reveal the general fitness of the applicant, and will cover the construction of lifeboats and life rafts, the

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names of their parts, and a description of the required equipment; the clearing away, swinging out, and lowering of boats and rafts, the handling of boats under oars or sails; the manipulation and functions of gravity, radial, and quadrantal types of davits; and nautical terms used in connection with launching and handling of lifeboats.

In the actual demonstration, the applicant must show his ability by taking command of a boat, directing the operations of clearing away, swinging out, lowering away, and acting as coxswain in charge. He must also demonstrate his ability to row by actually pulling an oar in the boat.

● Certificate as Able Seaman

An applicant for a certificate of service as able seaman must be at least 19 years of age. In order to obtain a certificate for service on the seas he must have had at least 3 years' service on deck at sea or on the Great Lakes; or he must have graduated from a school-ship approved by and conducted under rules prescribed by the Secretary of Commerce, and have had 12 months' service at sea after graduation. In order to be qualified for service on the Great Lakes, and on the smaller lakes, bays, or sounds, he must have had at least 18 months' service on deck at sea or on the Great Lakes, or on the smaller lakes, bays, or sounds. An applicant who has had 12 months' service at sea or on the Great Lakes may obtain a certificate, but not more than one-fourth of the number of able seamen required on a vessel may be composed of seamen rated on such service.

An applicant must file application with a board of local inspectors for examination, in the form prescribed by the regulations. He must appear personally before the board, must present to them a certificate from the Public Health Service concerning his eyesight, hearing, physical condition, and color sense, and must prove to its satisfaction, both by an oral examination and also by an actual demonstration, that he has been trained in all the duties of an able seaman.

The oral examination will consist of a series of questions designed to reveal the general fitness of the applicant. It will cover the following subjects: ships and their equipment, general arrangement, boats, etc.; specific duties, as steering, compass, engine telegraph, lookouts, soundings (hand and machine), running lights, passing signals, fog signals, log, blocks and tackles, marlinespike seamanship, lifeboats (must meet all requirements of certificated lifeboatman), ground tackle steering gear (with especial reference to emergency steering gear), steering telegraph, etc.; emergency drills, description of duties at fire, collision, lifeboat drills, etc.; distress signals; and cleaning and painting.

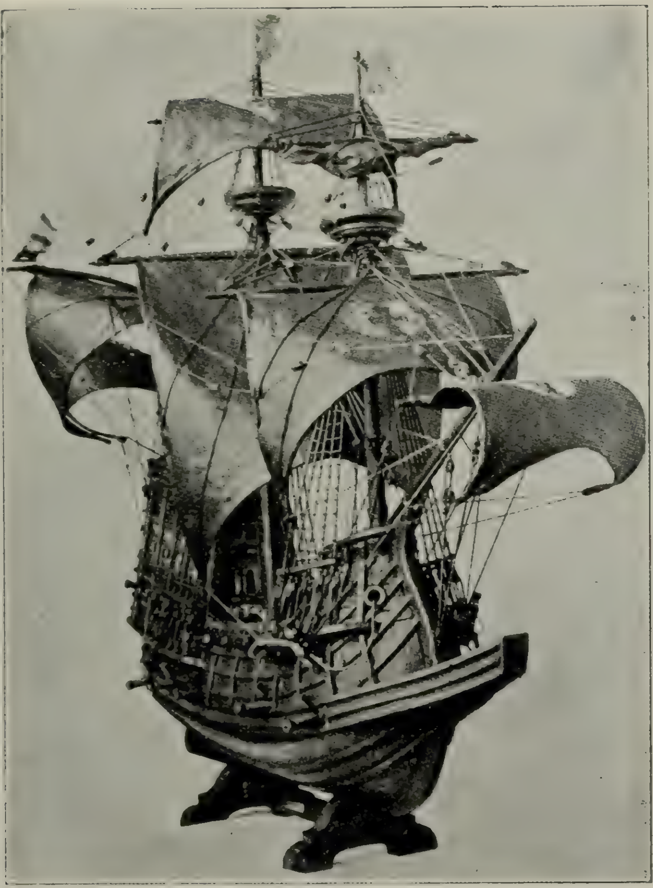
In the actual demonstration the applicant must show his ability by heaving a line; sounding with the hand lead; knotting and splicing (elementary), and by boat handling as required of an applicant for certificate of efficiency as lifeboatman.

In addition, an able seaman should have some knowledge of first aid, personal hygiene, and ship sanitation. This information may be obtained from The Ship's Medicine Chest and First Aid at Sea, published by the United States Public Health Service.

New Requirements for Ship's Radio

The Federal Communications Commission, under date of October 1, 1936, issued the Ship Radiotelegraph Safety Instructions, covering the requirements as to ship radiotelegraph installations and the radio watches to be maintained, necessitated by the International Convention for the Safety of Life at Sea, London, 1929, which becomes effective on the part of the United States on November 7, 1936. Those instructions apply to all ships of American registry engaged in international voyages, other than between the United States and Canada on any lakes and rivers, except cargo vessels of less than 1,600 tons, gross tonnage, unless specifically exempt by action of the Commission.

The above-mentioned instructions are very comprehensive in scope. They give in detail the technical requirements of the radio transmitter, radio receivers, emergency power supply, emergency lighting in the radio room, clock, lifeboat, radio installation, direction finder, auto-alarm and spare parts. The requirements as to the radio watches to be



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maintained by operators is of particular interest. All passenger ships and all cargo ships over 5,500 gross tons are required to maintain a continuous watch with such operators while all cargo ships of 5,500 gross tons or less shall maintain at least 8-hours watch by means of such operators. If and when an auto-alarm is approved by the Federal Communications Commission, such device may be used to maintain the continuous watch during part of the time, and all but one of the operators dispensed with.

Every ship coming under the provisions of the instructions is required not only to comply with such "instructions", but must be inspected as a prerequisite to the issuance of a safety certificate (for passenger ships) or a radiotelegraph safety certificate (cargo ships) provided for by the Safety Convention. A request for inspection should be addressed to the appropriate radio inspector of the Federal Communications Commission. Following this inspection the Bureau of Marine Inspection and Navigation will, upon certification from the Federal Communications Commission that the ship complies with the requirements of the safety convention, issue the appropriate certificate.

The ratification of the International Convention for the Safety of Life at Sea does not repeal the Ship Act of 1910, amended in 1912 (insofar as it covers ships of the United States) which requires radio installations on ships carrying or licensed to carry 50 or more persons and plying between ports 200 miles or more apart, and that two or more operators be employed. Attention is also invited to the fact that a radio station license is also required as has been the practice in the past.

Copies of the Ship Radiotelegraph Safety Instructions, as well as forms for requesting inspection, may be obtained from the Federal Communications Commission in Washington, from any office of the Bureau of Marine Inspection and Navigation, or from the Federal Radio Inspection offices at principal American seaports.

Recent Load Line Activities

An article, "Load Lines," appearing in the October issue of the "Bulletin," Bureau of Marine Inspection and Navigation, traces the whole history of load line legislation in America. The author, Laurens N. Prior, chief of the Load Line Section of the Bureau, sums up as follows the activities along this line since the close of the International Conference on Load Lines at London in the summer of 1930:

The conference closed July 5, 1930, after agreeing upon uniform rules and regulations for placing load lines on all ships of 150 gross tons and above, engaged on international voyages, excepting ships of war,

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fishing vessels, yachts, and ships without cargo or passengers.

The rules adopted followed very closely the British proposals as to cargo ships, but provided for deeper loading of tankers, ships of special type, and ships carrying deck loads of lumber. The convention also adopted weather zones to control the loading therein.

The convention excepted the Great Lakes of North America from its requirements. The convention also took notice that in certain parts of the world foreign voyages were made over sheltered waters and provided that where such conditions existed that the countries having jurisdiction of such waters could by agreement among themselves exempt from the requirements of the convention such ships as made foreign voyages confined entirely to such sheltered waters.

The International Load Line Convention was ratified by the Senate February 27, 1931. The Secretary of Commerce, acting under the authority of the Load Line Act of 1929, promulgated, as load line regulations, the technical requirements and formulas contained in the International Convention.

As a result of several major casualties to American ships, the Seventy-fourth Congress gave attention to maritime safety legislation and the Coastwise Load Line Act of 1935 was enacted. This act required load lines to be placed on all merchant ships of 150 gross tons or over operating in the coastwise trade and on the Great Lakes and, with the exception of Great Lakes, required ships to have load lines placed not higher than allowed by the International Load Line Convention.

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To give consideration to the exemption of Great Lakes ships in the 1935 act, the Secretary of Commerce appointed a Great Lakes Load Line Committee, Joseph B. Weaver, chairman, L. C. Sabin, vice chairman. This committee had available the records of the Sevenson Taylor Committee of 1916 and had the complete cooperation of the Lake maritime interests. The conclusions of this committee, drawn in the form of Load Line Regulations for the Great Lakes, were presented to a public meeting in Cleveland, and without material modification, were then submitted to the Secretary of Commerce, when approved and put into effect.

During 1936 Congress considered that, for certain classes of vessels engaged in the coastwise trade, limiting the load line to the position fixed by the International Convention would not necessarily be correct, and provided that, in applying load lines to vessels on the Great Lakes and to steam colliers, tugs, barges, and self-propelled barges engaged in special services in inter-island voyages and on coastwise voyages from port to port in the continental United States, the Secretary of Commerce is vested with discretion to vary the position of the marks as determined by the treaty.

In order to give effect to the amendment of 1936, the Secretary of Commerce appointed a committee, H. A. Gilbert chairman, to study the load-line requirements of steam colliers, tugs, barges, and self-propelled barges. This committee is still engaged in its study of this problem and has not yet submitted a report.

Irrespective of the further action yet to be taken by the Secretary in connection with the special classes of vessels engaged in the coastwise trade referred to above, the United States with the enactment of the Coastwise Load Line Act and the promulgation of regulations thereunder, has by law prohibited jeopardizing the lives of the crews of cargo ships by overloading, with the result that this country now ranks on a par with the leading maritime nations of the world with regard to load line requirements.

Marine Insurance Briefs

President **J. B. Levison**, of the Fireman's Fund Group, announces the appointment of **John H. McKinney** as assistant manager of the companies' Atlantic Marine Department in New York City. McKinney will be in charge of production.

Joining the department in May, 1934, he has been active in production work in the metropolitan area, and in the supervision of field work among agents in the eastern territory.

Prior to joining the Fireman's Fund, McKinney had a long experience in inland marine activities. His early experience was in the local agency business in St. Louis, following which he engaged in field work in Michigan, Connecticut, and New York.

James H. Todd, formerly in the brokerage department of Geo. E. Billings and Company, has recently been appointed manager of the marine department of Edward Brown and Sons. Prior to his connection with Geo. E. Billings, Todd was for many years with the Luckenbach Steamship Company and with Sudden & Christenson.

MARINE DEPARTMENT
Aetna Insurance Co.
Queen Insurance Co.
Maritime Insurance Co., Ltd.
Fidelity Phenix Fire Ins. Co.
Commercial Hull Dept.
Automobile Ins. Co.
MATHEWS & LIVINGSTON
Marine Underwriters
200 BUSH ST. SAN FRANCISCO
Offices at
Colman Bldg 111 West 7th St.
Seattle Los Angeles

On the Ways -

SHIPS IN THE MAKING

LATEST NEWS FROM AMERICAN SHIPYARDS

Naval Shipbuilding Program Benefits Entire Country

Shipbuilding costs are made up approximately as follows: 40 per cent labor plus 40 per cent material plus 20 per cent overhead equals 100 per cent. About 40 per cent of the cost of building a ship goes to labor at the site. Of the 40 per cent cost of material, about 70 per cent goes to labor from the site, namely, in the field, all the way back to the forest and the mines. Of the overhead cost, about 80 per cent goes to labor. Therefore, about 84 per cent of all the money goes to labor in the shipbuilding industry.

The money appropriated for the Navy, whether for pay, food, new ships, maintenance, or other purposes, is nearly all returned very promptly to the general channels of commerce and industry. It therefore serves as a stimulus to the general business of the country.

In the recent construction of naval vessels, expenditures have been made amounting to $90,000,000 for materials of the classes listed:

Bolts, nuts, washers and rivets	$ 404,952
Cast-iron pipe and fittings	569,931
Electric wiring and fixtures	1,681,657
Electrical machinery and apparatus and supplies	9,509,463
Elevators and elevator equipment	235,193
Engines and turbines	9,838,347
Forgings, iron and steel	4,284,483
Foundry and machine shop products	7,036,218
Glass	118,909
Hardware	117,053
Heating and ventilating equipment	486,010
Lumber and timber products	468,702
Machine tools	730,879
Metal doors, shutters, window sash and frames	1,102,889
Paints and varnishes	127,972
Petroleum products	138,814
Planing-mill products	5,268
Plumbing fixtures and supplies	141,678
Pumps and pumping equipment	1,822,567
Steel products	35,521,308
Tiling, floor and wall	27,136
Wall plaster, wall board and insulating board	100,155
Wire and wireworks products	434,050
Other materials	15,754,992

An analysis shows that these materials are received from every State in the Union.

Boston Navy Yards News.

New Great Lakes Tanker

Contract for the construction of a 465-foot electrically welded oil tanker, with a carrying capacity of 2,700,000 gallons of oil, has been awarded to the Manitowoc Shipbuilding Corporation by the Standard Oil Company of Indiana. According to the contract, the new tanker is to be delivered to the Standard Oil Company in the fall of 1937 for use on the Great Lakes.

The securing of this contract introduces to some extent a new era in shipbuilding in Manitowoc. The entire interior of the tanker is to be electrically welded.

Not only will the hull be built there, but the boilers and machinery for the tanker will be the product of Manitowoc labor. The tanker, which will be 465 feet long, 55 feet beam, 28 feet depth of hold, will be equipped with a triple expansion surface condensing engine of 2,500 horsepower.

Steam at 200 pounds pressure will be supplied by two of the largest Scotch boilers ever to be built on the Great Lakes. The boilers and machinery will be turned out in the plant of the Manitowoc Boiler Works, a subsidiary of the shipbuilding corporation.

Satisfaction of the company with construction work on another tanker built by the yard for the Standard Oil Company in 1929 and 1930 is believed to have been a contributing factor in awarding the contract. Six years ago the steel oil tanker Edward G. Seubert, for the same company, was completed in Manitowoc and has been in continuous service. The Seubert is of slightly less capacity than called for in the contract for the new tanker.

Building in American Yards

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
(Union Plant)
San Francisco

NEW CONSTRUCTION: **Hull 5355—McCall (DD400).** Completion date 9/19/37, **Hull 5356—Maury (DD401);** completion date 12/19/37; two 1500-ton destroyers for U. S. Navy; length, 341′ 3⅝″; beam, 35′ 6⅛″; depth, 19′ 8″. Cost $2,675,000.

Hull 5359, Pacific; seagoing hopper dredge for U. S. Engineers; completion date, April 2, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Chiriqui, Tug A. G. Wells, Mericos H. Whittier, Point Salinas, Malolo, M.S. Alexia, Talamanca, Frank H. Buck, Condor, U.S.A.T. St. Mihiel, Santa Elena, Santacruzcement, Charcas, Antigua, Pres. Taft, Maunganui, Halo, Lurline, K. R. Kingsbury, Pennmar, Franks Contract Mud Barge, F. H. Hillman, U.S. Dredge Culebra, Paul Shoup, W. S. Rheem, Stm. Sch. Redwood, Cuzco.**

THE CAMPBELL MACHINE COMPANY
Foot of Eighth Street
San Diego, California

NEW CONSTRUCTION: **Hull 49, Belle of Portugal, tuna clipper;** Lawrence Oliver & Co., owners. Length 130′; main engine 550 h.p. 6 cylinder Union diesel engine. Launched September 19, 1936; completion date, January 1, 1937.

Hull 50, Picaroto, tuna clipper; Lawrence Oliver, Rosa Bros. & Co., owners; sister ship of Belle of Portugal, Launched October 15, 1936; completion date, January 1, 1937

Hull 53, Victoria, tuna clipper; Mathew C. Monise, owner. Length 135′, main engine 600 h.p. 6 cylinder Union diesel. **Launching date, November 1, 1936;** completion date, March 1, 1937.

Hull 54, Triunfo, tuna clipper; Joaquim Canas & Co., owners. Length 125′, main engine 450 h.p. 6 cylinder Union diesel. **Launching date, November 10, 1936;** completion date, March 1, 1937.

FELLOWS AND STEWART, INC.
Wilmington, Calif.

NEW CONSTRUCTION: **4 keels laid** July 6, 1936, Fellows Craft stock cruisers 30′ x 8′ x 2′6″, powered with Kermath Sea Flyer 6-cylinder 85-H.P. engines with 2 to 1 reduction gears.

One 45 ft. ferry service boat powered with twin 110 H.P. Buda diesels.

Five 32 ft. W.L., 46 ft. O.L. One design sloop yachts, keels to be laid in the immediate future.

Auxiliary power, with small h. p.

DRYDOCK AND ROUTINE REPAIRS: 32 vessels, ranging from 40 ft. to 110 ft., on the railway for misc. repairs and renovating, with an additional 10 hauled out for winter storage in the yard.

GENERAL ENGINEERING AND DRYDOCK CO.
Foot of Fifth Avenue
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Str. Barbara C, Gas S. New Monterey, Gas. S. San Guiseppe, Ship Star of Finland, Unimak, Bertie Hanlon, Cottoneva, Fireboat Dennis T. Sullivan, Noyo, Stanwood, Gas. S. Concord, Gas. S. Olympic, Gas. S. Dux, Gas. S. Wehmeyer, Tug Falcon, Gas. S. Ocean Pride.**

HARBOR BOAT BUILDING CO.
Berth 264—Fish Harbor
Terminal Island, Calif.

NEW CONSTRUCTION: **Four 80′ U. S. Coast Guard patrol boats; 1,600 H.P.** each; Liberty-Vimalert conversions; speed 30 m.p.h. Keels laids September, 1936; estimated launching, March, 1937; expected completion, July, 1937.

HONOLULU IRON WORKS
Honolulu, T. H.

DRYDOCK AND ROUTINE REPAIRS: **Dickenson, Olympia, President Coolidge.**

THE LOS ANGELES SHIPBUILDING & DRY DOCK CORP.
Los Angeles Harbor
San Pedro, Calif

DRYDOCK, PAINT, MISCELLANEOUS: **Golden Sun, Golden Dragon, Tug Capt. William, Tug Listo, M.V. Capella, Mojave, Rossington Court, Tug D. M. Benton, G/B Princess, Golden Horn, Brandywine, Catalina, Deroche, W. R. Chamberlin, Jr.**

THE MOORE DRY DOCK CO.
Oakland, Calif.

DRYDOCK AND ROUTINE REPAIRS: **Alabaman, Arkansan, Carolinan, Polarine, Pennsylvanian, Golden Coast, K. R. Kingsbury, Transport Meigs, El Aguador, M.S. Roseville, Esther Johnson, Davenport, Dorothy Wintermote, Brunswick, Brookings, Vagabond, Kansan, San Anselmo, American Star, Stuart Dollar, Foy Derrick Barge, Sunmaid, Oregonian, Iowan, West. Pac. Barge No. 1, Frances, New Rex.**

PRINCE RUPERT DRYDOCK AND SHIPYARD
Prince Rupert, B.C.

DRYDOCK AND ROUTINE REPAIRS: 1 scow, 2 fishing boats, 24 ship repair jobs not requiring docking, 26 commercial jobs.

THE PUGET SOUND NAVY YARD
Bremerton, Washington

NEW CONSTRUCTION: **U.S.S. Patterson** (Destroyer No. 392); standard displacement, 1500 tons; keel laid July 23, 1935; estimated completion date, February 1, 1937.

U.S.S. Jarvis (Destroyer No. 393); standard displacement, 1500 tons; keel laid August 21, 1935, estimated completion date, May 1, 1937.

Construction of **Destroyer No. 408, U.S.S. Wilson,** 1500 tons, keel not yet laid.

DRYDOCK AND ROUTINE REPAIRS: **West Virginia, Colorado, Texas, Salt Lake City.**

STEPHENS BROS. BOATYARD
Stockton, Calif.

NEW CONSTRUCTION: **Folderol, 45′** cruiser, teakwood hull, equipped with Scripps 164-165 motors, for Marshall Dill, San Francisco; launched October 4, 1936.

Keel laying begun for ten 36 and ten 29′ stock keels.

TODD SEATTLE DRY DOCKS, INC.
Harbor Island, Seattle, Wash.

DRYDOCK, PAINT, MISCELLANEOUS: **West Camargo, Baranof, La-**

touche, Dorothy Cahill, Northland, Condor.

UNITED STATES NAVY YARD
Mare Island, Calif.

NEW CONSTRUCTION: **Henley**, Destroyer (DD391); standard displacement 1500 tons; keel laid October 28, 1935; to be launched early in 1937.

Pompano, Submarine (SS181); estimated delivery August, 1937; keel laid January 14, 1936.

Sturgeon, Submarine (SS187); keel laid October 27, 1936; launching date not set; completion date June 1, 1938.

DRYDOCK AND ROUTINE REPAIRS: **Farragut, Dewey, Hull, Worden, Litchfield, Chandler, San Francisco, Tuscaloosa, Bridge, Langley, California State, Eagle No. 32, Bonita, Bass.**

WESTERN BOAT BUILDING CO.
Tacoma, Wash.

NEW CONSTRUCTION: **Keel No. 120,** Purse Seine Fishing boat. 87′ long, 23′ beam. 240 H.P. Atlas Imperial engine. Keel laid September 15; estimated launching, December 1, 1936; completion date, January 1, 1937. No owner as yet.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Pennsylvania

NEW CONSTRUCTION: **4 coal barges** 195′x35′x11′; **4 dump scows** 114′x26′x 7′9″; **20 coal barges** 175′x26′x11′.

THE AMERICAN SHIP BUILDING COMPANY
Cleveland, Ohio

NEW CONSTRUCTION: **Contract for dredge hull** to be built at Buffalo plant.

BATH IRON WORKS
Bath, Maine

NEW CONSTRUCTION: Hulls Nos. 161, 162, and 163; **DD394 Sampson, DD395 Davis** and **DD396 Jouett**; Three 1850-ton destroyers for U.S. Navy; date of contract Sept. 19, 1935. Estimated delivery Dec. 1937, Mar. 1938, and June 1938, respectively. **DD396**, keel laid, Mar. 26, 1936. **DD395**, keel laid July 28, 1936. **DD394**, keel laid April 8, 1936.

Hull No. 164, Storm, trawler, single screw, steel, diesel propelled, for Boston, Mass., owners.

Hull No. 167, Ferryboat Aquidneck. Diesel electric ferry for U.S. Navy; estimated delivery, March, 1937.

Hull No. 169, Trawler, single screw, diesel propelled, for delivery to Boston, Mass., owners in April, 1937.

Hulls Nos. 170-171, two 1500-ton destroyers for U. S. Navy; contract date October 12, 1936; delivery date April, 1939, and June, 1939, respectively.

Hull No. 172, "J" class sloop for Mr. Harold S. Vanderbilt; delivery spring, 1937.

BETHLEHEM SHIPBUILDING CORPORATION
Fore River Plant,
Quincy, Mass.

NEW CONSTRUCTION: **Heavy Cruiser CA44, Vincennes,** 10,000 tons. Keel laid January 2, 1934; launched May 21, 1936; estimated delivery, January, 1937.

DD-380, Gridley, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated launching, December, 1936; estimated delivery, March, 1937.

DD-382, Craven, 1500 Ton Destroyer. Keel laid June 3, 1935; estimated delivery, June, 1937.

CV7, Airplane Carrier for U.S. Government; keel laid April 1, 1936; estimated delivery, September, 1938.

Hull 1463, U. S. Army Hopper Dredge Goethals; 5000 cubic yards capacity; estimated delivery February 1, 1938.

BETHLEHEM SHIPBUILDING CORPORATION
Sparrows Point Plant
Sparrows Point, Md.

NEW CONSTRUCTION: **Two oil Tankers**—steam—425′x64′x34′ for Gulf Refining Co.; total tonnage 7070 each.

IRA S. BUSHEY & SONS, INC.
Foot of Court Street
Brooklyn, New York

NEW CONSTRUCTION: **Two 76′ all-welded diesel towboats** of 450 horsepower each.

One 90′ all-welded diesel towboat of 750 horsepower.

CHARLESTON SHIPBUILDING & DRYDOCK CO.
Charleston, S.C.

NEW CONSTRUCTION: One 65′ all welded steel diesel tug for the Krajewski-Pesant Mfg. Co., New York.

DRYDOCK AND ROUTINE REPAIRS: **Tug Cecelia, U.S. lightship Relief, Standard Dredging Co.'s Dredge, Tug Audrey, Pontoon Barge — Gulf Construction Co., Pilot Boat Denham, Tug Lockwood, Launch Regulator, Tug General R. H. Jackson, Launch Sunbeam, U.S. lightship Savannah.**

CONSOLIDATED SHIPBUILDING CORP.
Morris Heights, New York City

NEW CONSTRUCTION: **65-footer** for E. E. Dickinson, powered with 2 Speedways, **42-footer** for A. P. Green, powered with 2 110-H.P. Kermaths.

Four 39-foot "play boats" for stock.

34-foot Florida guide-boat, powered with 2 Grays.

42-foot Florida guide-boat, powered with 2 Grays.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

NEW CONSTRUCTION: **One 175′x34′ x10′ tender** for U.S. Lighthouse Dept. Two triple expansion steam engines; total horsepower 1000; keel laid July 1, 1936; estimated delivery, February 1, 1937.

One fire boat for City of Chicago, 90′ 6″ long, 22′4″ beam; diesel power; pumping capacity, 7,500 gallons per minute at 150 pounds; delivery January 1, 1937.

THE DRAVO CONTRACTING CO.
Engineering Works Dept.,
Pittsburgh, Pa., and Wilmington, Del.

NEW CONSTRUCTION: **Hull No. 997,** one diesel sternwheel towboat of 91 gross tons.

Hull No. 1297, one welded oil barge 110′ x 30′ x 11′ for Patterson Oil Terminals, Inc., Philadelphia, Pa.; 335 gross tons.

Hulls Nos. 1298-1299, inclusive; two self-propelled diesel pipe line dredges, Thompson and Rock Island, for U.S. Engineers, St. Paul; 3974 gross tons.

Hull 1310, one welded steel coal barge, 134′ x 34′ x 16′, of 362 gross tons.

Hulls 1311-1313, inclusive; three riveted sand and gravel barges 100′ x 26′ x 6′6″, for Smoot Sand and Gravel Corp., Washington, D. C.,; 495 gross tons.

Hulls Nos. 1318-1323, inclusive; six welded type W-3 coal barges 175′ x 26′ x 10′8″ for stock, 4720 gross tons.

Hulls Nos. 1324-1327, inclusive; four welded flush deck cargo box barges 100′ x 26′ x 6′6″; 660 gross tons.

Hulls Nos. 1328-1337, inclusive; ten welded type W-3 coal barges 175′ x 26′ x 10′8″ for stock; 4720 gross tons.

Hulls Nos. 1338-1341, inclusive; four welded hopper type steel coal barges 100′x26′x10′8″, for O. F. Shearer Sons; 1080 gross tons.

Hulls Nos. 1342-1351, inclusive; ten welded type W-3 coal barges 175′x26″x 10′8″, for stock; 4720 gross tons.

This makes a total of 42 hulls under contract, with a total gross tonnage of 19,269.

ELECTRIC BOAT CO.
Groton, Conn.

NEW CONSTRUCTION:

Hull No. 24, Pickerel, S.S. 177 keel laid March 25, 1935; launched July 7, 1936; estimated completion date, January, 1938.

Hull No. 25, Permit, S.S. 178, keel laid June 6, 1936; launched October 5, 1936; delivery date, March, 1938.

Hull No. 26, Salmon, SS182, standard displacement 1450 tons; keel laid April 15, 1936.

Hull No. 27, Seal, SS183, standard displacement, 1450 tons; keel laid May 25, 1936.

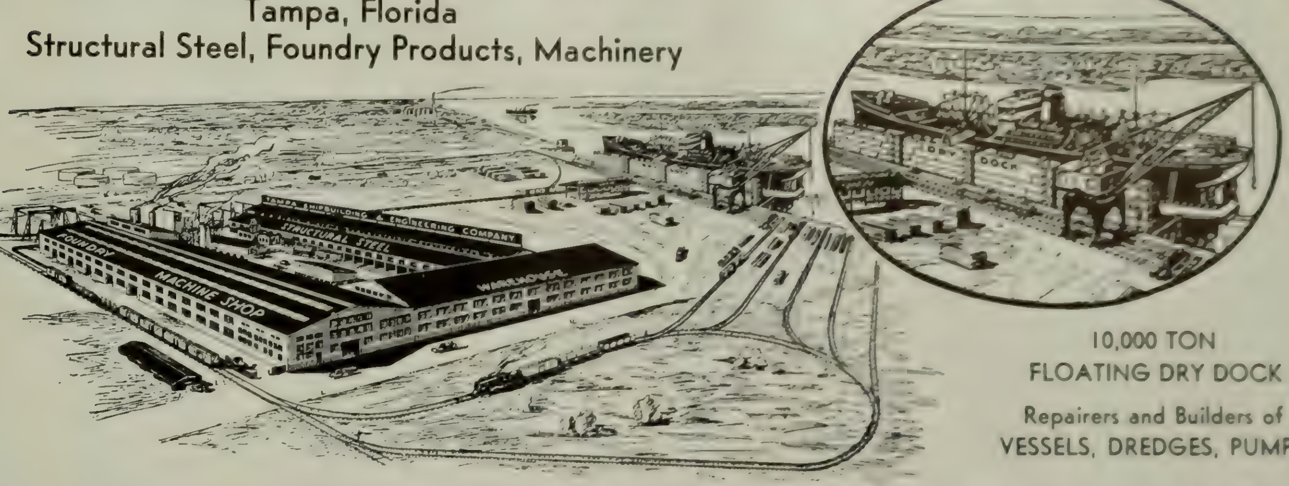
Hull No. 28, Skipjack, SS184, standard displacement, 1450 tons; keel laid July 22, 1936.

THE FEDERAL SHIPBUILDING AND DRYDOCK COMPANY
Kearny, N. J.

NEW CONSTRUCTION:

Two destroyers, **DD381 Somers** and **DD383 Warrington**; keels laid June 27,

TAMPA SHIPBUILDING & ENGINEERING CO.
Tampa, Florida
Structural Steel, Foundry Products, Machinery



10,000 TON
FLOATING DRY DOCK

Repairers and Builders of
VESSELS, DREDGES, PUMPS

PLANT: 19TH & GRANT STREETS—PHONE Y-1112. THIS DRY DOCK WILL BE READY FOR BUSINESS IN NOVEMBER
TAMPA BAY FREE FROM EXCESSIVE STORMS, A GOOD PLACE FOR YACHTS TO LAY OVER SUMMER AND WINTER.

1935 and October 10, 1935, respectively; estimated launching, December, 1936 and January, 1937, respectively; estimated completion March 1, 1937.

Three destroyers, DD 397, DD 398 and DD 399; estimated completion January, April and July 1938; keel laid, DD397, September 1, 1936.

One 12,800 ton tanker for the Pan American Petroleum and Transport Company, keel laid March 17, 1936; **estimated completion date, December, 1936.**

Four 12,800-ton tankers for the Standard Oil Company of New Jersey; Isherwood Arcform design of hull form and longitudinal hull framing.

THE INGALLS IRON WORKS COMPANY
Birmingham, Ala.

NEW CONSTRUCTION: **Four barges,** 132'x30'x7'9", for carrying petroleum products in six tanks in hull or for heavy deck loading. Two to be built at Chikasaw (Mobile), Alabama, yard and two at Decatur, Alabama, yard (on Tennessee River); for stock.

JAKOBSON & PETERSON, INC.
Ft. of 16th Avenue
Brooklyn, New York

NEW CONSTRUCTION: **One 65' all welded steel combination tow boat and tanker** for the Lewis Coal & Oil Corp. of Port Washington, N.Y. To be powered with 300-H.P. Atlas Imperial diesel engine. **Launching date, November 18, 1936; completion date, December 23, 1936.**

LEVINGSTON SHIPBUILDING CO.
Orange, Texas

NEW CONSTRUCTION: **One full model hull, all-welded diesel tug,** 55' long, 14' beam, 7'6" deep; 120-horsepower Fairbanks-Morse marine diesel engine; for Atlantic, Gulf & Pacific Co., New York City.

One all-welded, steel derrick barge 50' x 28' x 5'3", for Austin Bridge Co., Dallas, Texas.

One all-welded, steel ferryboat, length overall, 149', beam over guards, 66', beam molded, 54', depth molded, 11'. Twin screw diesel electric. Two 350-horsepower Cooper-Bessemer diesel engines with Westinghouse generators and motors. For Algiers Public Service Corp., New Orleans, Louisiana.

MANITOWOC SHIPBUILDING CO.
Manitowoc, Wis.

NEW CONSTRUCTION: **One single screw, electrically welded, steel oil tank steamer,** 465'x55'x28', for Standard Oil Co. of Indiana, to be used on Great Lakes; triple expansion surface condensing engine of 2,500 h.p.; two Scotch boilers; carrying capacity, 2,700,000 gallons of oil; delivery date, autumn, 1937.

MARIETTA MANUFACTURING COMPANY
Point Pleasant, West Virginia

NEW CONSTRUCTION: **Opon, sternwheel river steamer,** 200' x 44' x 5'6"; keel laid November 6, 1936.

One stern wheel all welded steam towboat, 190'x42'x7'6", for Standard Oil Co. of N. J., for service on lower Mississippi River; Foster-Wheeler water tube boilers; Marietta Mfg. Co. tandem compound engines of piston poppet type; H.P. cylinders 16" in diameter; L.P. cylinders 32" in diameter; common stroke of 10'.

MARYLAND DRYDOCK CO.
Baltimore, Maryland

NEW CONSTRUCTION: **Three steel covered lighters,** 120' x 30' x 8', for the Merchants & Miners Transportation Company.

One steel, double ended, diesel electric ferryboat, for Norfolk, Va.

THE NEW YORK SHIPBUILDING CORPORATION
Camden, N. J.

NEW CONSTRUCTION: **Contract for** three destroyers: **Hull No. 409, Selfridge (DD357),** launched April 18, 1936; **Hull No. 410, McDougal (DD-358),** launched July 17, 1936; **Hull No. 411, Winslow (DD359),** launched September 21, 1936; of 1850 tons each; keels laid, Dec. 1933.

Three light cruisers; Hull No. 412, Savannah (CL42), Hull No. 413, Nashville (CL43), and **Hull No. 416 Phoenix (CL46) of 10,000 tons each for the U.S. Navy Department; keels laid, 1935;**

NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
90 Broad Street, New York

NEW CONSTRUCTION: **H 359 aircraft carrier CV5, Yorktown, for U. S.** Navy; keel laid May 21, 1934; launched April 4, 1936.

H360 aircraft carrier, CV6, Enterprise, for U.S. Navy.; keel laid July 16, 1934; launched October 3, 1936.

H361, light cruiser, CL47, Boise, keel laid April 1, 1935; **estimated launching, December 3, 1936.**

H362, light cruiser CL49, St. Louis; estimated keel laying, December 14, 1936.

Hulls Nos. 363-364, two destroyers; contract awarded.

THE PUSEY & JONES CORP.
Wilmington, Del.

NEW CONSTRUCTION **Hull No. 1066** — one steel hull towboat building for Donaldson Towing & **Lightering Co., Phila., dimensions: 95'** L.O.A. 88' L.B.P. x 24' x 14' 9"; one **Unaflow vertical marine type engine,** two cylinders 25" dia. x 20" stroke, 180 **R.P.M. 600 I.H.P. One Scotch type boiler 13' 3" diam. x 11' 6" long, 3 furnaces,** 185 lbs. W.P. Estimated delivery, February, 1937.

Lt. Colonel Ellery W. Niles, twin screw diesel electric drive mine planter for submarine and cable service; L.O.A. 184', L.B.P. 163', beam molded 35', depth molded amidship at sides 17'3", draft load 10'6", speed per hour 13 statute miles; delivery, September, 1937.

SPEDDEN SHIPBUILDING CO.

Baltimore, Md.

NEW CONSTRUCTION: **One 60-foot iron hull, all-welded V bottom boarding and fumigating vessel for U. S. Public Health Service**; equipped with twin screw Superior diesel engines. Keel laid November, 1936; launching date, February 1, 1937; delivery date, March 23, 1937.

DRYDOCK AND ROUTINE REPAIRS: **Acid Barge Curtis Bay, Tugs Margaret, Elma, Montrose, T. J. Hooper, Mascot, Hamilton, J. D. Graham, Dispatch.**

SUN SHIPBUILDING AND DRYDOCK COMPANY

Chester, Pa.

NEW CONSTRUCTION:

Hulls No. 157-158. Two single screw bulk oil tankers for the Socony Vacuum Oil Co. 485'6"x68'0"x37'0"; 15,000 tons deadweight; one 4000 S.H.P. cross compound double reduction geared turbine unit; three watertube boilers. Estimated dates for Hull No. 157. Keel laying April 15, 1936; **launching Dec. 10, 1936; delivery Dec. 28, 1936.** Estimated dates for Hull No. 158. Keel laying May 8, 1936; **launching Dec. 12, 1936**; delivery January 15, 1937.

Hull No. 159, 1 oil tanker (diesel), 511'x65'9"x37'; 15,800 tons.

Hull No. 160, 1 oil tanker (steam) 520'x70'x40' for Atlantic Refining Co.; 18,500 tons.

Hulls No. 161 and 162, steam tankers for Standard Oil Company of New Jersey; 422' x 65' x 35'; 12,900 dwt.

Hulls No. 163 and 164, diesel tankers for The Texas Company; 465' x 65' x 34'6'; 12,000 dwt.; **keel laying, December 1, 1936 and December 15, 1936, respectively.**

TREADWELL CONSTRUCTION COMPANY

Midland and Erie, Pa.

NEW CONSTRUCTION: **1 steel gold dredge** (ladder type) **hull** 155'x70'x13' for South American firm.

Two dump scows 93' x 22' x 8'10" for U. S. Engineer, Cincinnati, Ohio.

24 pontoons 48' x 16' x 2'6" for U. S. Engineer, St. Paul, Minn.

UNITED SHIPYARDS, Inc.

Staten Island, N.Y.

NEW CONSTRUCTION:

DD384, U.S.S. Dunlap, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched April 18, 1936; estimated delivery, February 9, 1937.

DD385, U.S.S. Fanning, Destroyer for U.S. Navy; L.B.P. 334'0"; beam 35'0"; mean draft 10'10"; keel laid Apr. 10, 1935; launched September 18, 1936; estimated delivery, April 9, 1937.

Hulls Nos. 840, 841, and 842; three ferry boats for City of New York; 267' overall, 66' extreme breadth, 19'9" depth; keels laid April 4, April 27, and May 1, 1936, respectively; estimated launching, January 18, February 8, and March 1, 1937, respectively; estimated delivery, March 19, April 9, and April 30, 1937, respectively.

UNITED STATES NAVY YARD

Boston, Mass.

NEW CONSTRUCTION: **Destroyer DD370, Case**, L.B.P. 334'; beam 35'; depth 19'8"; keel laid, Sept. 19, 1934; launched Sept. 14, 1935; commissioned September 15, 1936; estimated delivery, January, 1937.

Destroyer DD371, Conyngham, L.B.P. 334'; beam 35'; keel laid Sept. 19, 1934; launched Sept. 14, 1935; commissioned Nov. 4, 1936; estimated delivery, February, 1937.

DD389, Mugford, and DD390, Ralph Talbot, two light destroyers; LBP 334'; beam 35'6"; depth 19'8"; keels laid October 28, 1935; launched October 31, 1936; estimated delivery, April, 1937 and July, 1937, respectively.

DD402, Mayrant, and DD403, Trippe, two light destroyers for United States Navy; LPB 334'; beam 35'6"; depth 19'8"; estimated delivery, June and August, 1938.

Order placed for **DD415** and **DD416**, two destroyers; no dates set.

UNITED STATES NAVY YARD

Brooklyn, N.Y.

NEW CONSTRUCTION:

CL 40, **Brooklyn**, light cruiser, L.B.P. 600'; beam 61'8"; standard displacement, 10,000; geared turbine engines; express type boilers; keel laid, March 12, 1935; **estimated launching, November 30, 1936**; estimated delivery, November 1, 1937.

CL 48. **Honolulu**, light cruiser; L.B.P. 600'; beam 61'8"; standard displacement 10,000; geared turbine engines; express type boilers; keel laid September 10, 1935. Estimated launching indefinite; estimated delivery, September 1, 1938.

CL 50, **Helena**, light cruiser; L.B.P. 600'; beam 61'7¾"; standard displacement 10,000; geared turbine engines; express type boilers; **keel laying, December, 1936**; launching indefinite; contract delivery, May 16, 1939.

CG 69 and CG 70, **Alexander Hamilton and John C. Spencer**, cruising cutters for U.S.C.G. service; L.B.P. 308'; beam 41'; standard displacement 2000; geared turbine drive, express type boilers; keels laid Sept. 11, 1935; estimated floating date, November 10, 1936; estimated delivery, February 1, 1937, and March 1, 1937, respectively.

DRYDOCK AND ROUTINE REPAIRS: **Reid**, arrived October 31, 1936, for outfitting.

UNITED STATES NAVY YARD

Charleston, S.C.

NEW CONSTRUCTION: **One Coast Guard Cutter** (2000 tons). Keel laid August 15, 1935; estimated launching, January 14, 1937; estimated completion, April 15, 1937.

Order placed for **DD407 and DD418**, two 1500 ton destroyers; no dates set.

UNITED STATES NAVY YARD

Philadelphia, Pa.

NEW CONSTRUCTION: CL41, **Philadelphia**, L.B.P. 600'0"; beam 61',7¾"; molded depth at side to main deck amidships 42'0¾"; draft corresponding to normal displacement 21',8½"; standard displacement 10,000 tons; date of completion as reported by building yard, January, 1937.

Coast Guard Cutter No. 68, Roger B. Taney; L.B.P. 308', beam 41', depth molded at side to main deck amidships 23'6", draft corresponding to normal displacement 12'6", standard displacement 2000; estimated keel laying April, 1935; estimated completion, January 1937.

CA45 Wichita, L.B.P. 600, beam 61' 9¾", depth molded at side to main deck amidships 42'0 3/8", draft corresponding to normal displacement 21'10"; standard displacement 10,000; estimated completion January 1, 1938.

Order placed for **DD404**, 1500 ton destroyer; no dates set.

UNITED STATES NAVY YARD

Portsmouth, N. H.

NEW CONSTRUCTION: **SS179 Plunger**, keel laid July 17, 1935; L.B.P. 292'6", beam 25', loaded draft 15'; launched July 8, 1936; estimated delivery Feb., 1937; **SS180 Pollack**, keel laid October 1, 1935; L.B.P. 292'6", beam 25', loaded draft 15'; launched September 15, 1936; estimated delivery May, 1937.

SS185 Snapper, submarine; keel laid July 23, 1936; L.B.P. 300', beam 26', loaded draft 15'7"; date of completion March 1, 1938; **SS186 Stingray**, submarine; keel laid October 1, 1936; L.B.P. 300', beam 26', loaded draft 15'7"; date of completion June 1, 1938.

Pusey and Jones Awarded Contract for Mine Planter

Contract has been awarded by the Quartermaster Corps of the War Department to the Pusey and Jones Corporation, Wilmington, Delaware, for a twin screw diesel electric drive mine planter for submarine mine and cable service. The ship will have the following dimensions: length overall, 184 feet; L.B.P., 163 feet; beam molded, 35 feet; depth molded amidship at sides, 17 feet 3 inches; draft load, 10 feet 6 inches; speed per hour, 13 statute miles. She will be named Lt. Colonel Ellery W. Niles, and is scheduled for delivery in September, 1937.

Helping American Seamen

An Analysis of the New Legislation for Maintaining a High Standard in Selection of Seagoing Personnel

By Joseph B. Weaver

Director of the Bureau of Maritime Inspection and Navigation

The control of the physical ship and its equipment—in other words, the control of the material—is comparatively simple as compared with control of the personnel element.

A ship is as safe, and no safer, than the skill and efficiency of its officers and crew, and in order to progress with the personnel phase of the problem parallel to the progress made in connection with the material phase of the problem, there has been passed (Public No. 808) the so-called personnel bill, labeled in some misinformed quarters as the "Copeland Dog Collar Act," which name has undoubtedly emanated from the most ridiculous conception of the meaning of the act; in fact, from an entire lack of appreciation of the meaning of the English language.

● Justice to Honest Seamen

I take this occasion to correct certain impressions which apparently are prevalent, and officially to advise all those interested as to the true and proper meaning of the act, with the sincere wish that certain misstatements be corrected and that those who have not understood the act may have an opportunity to recede from the rather ridiculous position in which they find themselves.

Primarily, this act is designed to improve conditions aboard ship and to give protection to the earnest and honest seagoing man who wishes to follow his chosen profession under satisfactory conditions, and who is proud of his record, his accomplishment and his honest calling.

I believe much of the legislation passed heretofore has had very little consideration for the efficient, honest and able sailor but that it has had more or less the effect of making it possible for the very opposite type of man to receive the full protection and benefits which should from a spirit of justice accrue only to the better types.

This act establishes a three-watch system on deck as well as in the engine room on the majority of our seagoing craft. It limits the hours of work to eight hours a day. It safeguards, if properly administered, this phase of the working condition aboard ship, a condition earnestly sought for years by seamen.

This act requires the Bureau of Marine Inspection and Navigation to make a monthly inspection of all crew quarters on American vessels over 100 tons to see that these quarters are in accordance with our law, kept in a sanitary condition, and that ventilation, insulation and toilet facilities are satisfactory; in general, that these quarters, which are the seamen's home, are made as livable as possible.

● New Certificates Soon

The law provides for the cancellation of all existing lifeboat man and able seaman certificates, because it is common knowledge that these certificates are oftentimes sold as well as counterfeited and, consequently, are for the most part in the possession of those to whom they were not issued.

The law provides for a new series of certificates on which will appear a photograph of the seaman and the certificate will be of such nature that it will be difficult for anyone improperly to present or to possess such a certificate. Incident to the issuance of these new certificates a more intelligent examination is contemplated so that the certificate will actually mean what its name implies, a certification of the efficiency of the holder.

At this point I wish to assure all men now holding rightful certificates as lifeboat men and able seamen that only such inquiry as is necessary to prove that their certificates are rightfully held will be required by the bureau when they apply for the new certificate.

The act requires that every member of the crew below the rank of licensed officer must be in possession of a certificate of efficiency.

● Men to Have Record Books

A certificate is required for the engine room force above the rating of wiper and coal passer, and for "tankermen," those who are specially trained in handling dangerous cargoes.

A certificate of service is required for all other members of the crew on which will be endorsed the rating or occupation for which that particular man is qualified.

This section of the law goes into effect as to vessels engaged in foreign and intercoastal voyages on December 25, 1936, and as to all other vessels, except those exclusively operating on inland lakes and rivers on June 25, 1937.

Coincidently with the issuance of these certificates there will be furnished to every seagoing man below the rank of master, a socalled continuous discharge book, which I personally think should be called a continuous service record book, the purpose of which is simply to give a complete record in substantial book form with a photograph of the holder, of every voyage the holder has made and the position which the holder has had on the voyage in question.

The law is plain that no notations are permitted to be made in this book in regard to rating character and ability of the holder of the book.

There is a great misconception on the part of many as to just what is in this book and I wish to emphasize clearly and plainly that this book can in no way act or be used as a potential blacklist. Neither is it possible since the enactment of this law for any ship operator or group of ship operators or others to introduce their own record book, which as we know has been done in the past with unsatisfactory results to all.

Again, that there may be no misunderstanding, I repeat: This book contains, in addition to the seaman's identification, only the record of the voyages that the seaman has made and his position on these voyages.

● Serves as a Passport

This book is practically a Government passport, identifying our seagoing citizens. It is interesting to note that only recently have members of American crews been refused landing privileges in Russian ports, as the Soviet Government now requires governmental papers giving complete identification.

As you probably know, the officers of steamships are provided with Government licenses which are held by them as official recognition of their ability and highly prized by these officers.

It was the desire and intent of the Department, and received the approval of Congress, that effort should be made to have something, perhaps a little less than a license but nevertheless an official and respected service record of the seafaring personnel below the grade of officer.

These continuous discharge books will take the place of numerous discharge clips and provide identification of the individual, the ships upon which he has served, the trades in which he has been employed and the length of such service.

It contains nothing which could in any manner be detrimental to the individual. There is nothing whatsoever in the book concerning the quality of workmanship rendered.

I think it is obvious, however, that if a seaman is steadily employed in a given ship or trade, it is a natural conclusion that that seaman has rendered satisfactory service and is of the steady and reliable type of American workman.

This record book provides a safeguard against irresponsible elements slipping in through misidentification and taking the jobs of men who follow the sea as a calling, and should be a protection and a benefit to all steady workmen and industrious and ambitious sailors.

Centralized records will be kept in Washington of every seaman—a central bureau where all seamen can get their complete record, if for any purpose it is necessary.

This cover design for the invitations to the launching of the Pan American tanker Pan Florida at the Federal Shipbuilding yard is emblematic of the forward movement in American tanker construction.

Moore Dry Dock Busy

During the past month there has been great activity in the Moore Dry Dock Company — the average pay roll being one thousand men. All of these men were employed on repair and overhaul work.

Three Dollar steamers recently taken over by the American-Hawaiian Steamship Company were completely reconditioned and put in first class shape, ready for service. These vessels, formerly the Diana Dollar, Margaret Dollar, and Melville Dollar, have been renamed by the American-Hawaiian Steamship Company Alabaman, Arkansan, and Carolinan, respectively. All work of overhauling the above vessels was completed by the Moore Dry Dock Company far ahead of schedule.

The Polarine, now owned by the Polarine Fisheries, Inc., was formerly owned and operated by the Standard Shipping Company as an oil tanker. This vessel was converted into a fish reducing plant. It is the object of the owners to moor the vessel off-shore and receive the sardines and other fish from the fishermen; the fish are then ground and pressed by special machinery installed aboard the vessel. The oil extracted is stored in the tank compartments and the fish meal and other by-products stored in other compartments.

The Moore Dry Dock Company has also had a number of other general repair jobs.

New Standard Oil Tug

The Standard Oil Company of New Jersey has awarded a contract to Marietta Manufacturing Company, Point Pleasant, West Virginia, for a stern wheel steam towboat, hull size 190 feet x 42 feet x 7 feet 6 inches, which will be used in service on the lower Mississippi River.

The boat will be equipped with Foster-Wheeler water tube boilers and Marietta Manufacturing Company tandem compound engines of the improved piston, poppet valve type, the latter with H. P. cylinders 16 inches in diameter, L. P. cylinders 32 inches in diameter, and a common stroke of 10 feet. She will have an all welded steel hull.

Observations From The Crow's Nest

"NAMES AND NEWS" ★ BERNARD De ROCHIE, LOOK-OUT MAN

● Paul Faulkner Rejoins P.M.R.!

Paul Faulkner is back! Regular "Old Home Week" at Pacific Marine Review headquarters when he returned on November 16 to his former berth.

Paul is the chap who helped get out those weighty editions from 1923 to 1933. Ten years with the good old P.M.R. . . . as Advertising-Service Manager . . . with countless friends throughout marine circles.

For Paul Faulkner discovered San Francisco's Embarcadero when he was fifteen years old . . . and he's been covering the waterfront ever since.

He left an up-and-coming job with The Examiner in 1917 to cross on the Northern Pacific to make the world safe for the Democrats . . . returning in '19 on the Julia Luckenbach, when he joined up with old Pacific Mail as assistant to the colorful Douglas Erskine, organizer of the steamship company's first advertising and publicity department.

In 1920 Faulkner was appointed manager of this traffic promotion department, and was editor of **Pacific Mail and Grace Information,** circulated around the globe.

Readers of "Observations from the Crow's Nest" will remember his name at the masthead of this department of P.M.R. It's good to have Paul back at his old desk—although the Embarcadero, California, Market, and the industrial section will see more of him that the office furniture. Paul's that way. He likes to call on you—and you—and you—bringing service ideas and following through on his promises.

Yessir — Paul Faulkner's back home!

We present an old friend! Paul Faulkner rejoins P.M.R.

A recent arrival in San Francisco from San Pedro, where he was inspector of hulls during the last six years, was **Captain Joseph J. Meany,** who is to be permanently stationed in the San Francisco office. Captain Meany was under **Captain S. A. Kennedy** in the South, and for years was master on vessels of the Luckenbach fleet before he joined the Federal inspection staff. The San Pedro vacancy has not been filled as yet.

John H. Wholley, district freight agent for Dollar Lines in San Francisco, recently received his commission as lieutenant in the United States Naval Reserve, after having been stationed ashore for 18 years. He served in the Navy during the war, but has since been too occupied with affairs on land to spend any time at sea. Just to see whether he could pass after so long a time ashore, Wholley studied for the commission and won it with great credit.

David S. Youngholm was elected vice president of the Westinghouse Electric & Manufacturing Company at the last meeting of the Board of Directors. He will make his headquarters in New York.

Mr. Youngholm joined the Westinghouse organization 27 years ago. His first position was in the engineering department of the Westinghouse Lamp Company, after which he entered the sales department.

In 1924 he was placed in charge of production of the Westinghouse Lamp Company, a year later became assistant manager of sales, in 1927 was made assistant general superintendent, in 1930 became assistant to vice president, and later became vice president.

Commodore Ed Harms.

Propeller Club Christmas Party

7:00 P.M.

December 16

Terrace Ball Room

Fairmont Hotel

Skipper Joe Geary.

President
JOSEPH J. GEARY
Secretary-Treasurer
STANLEY E. ALLEN
320 Market Street, Room 249,
San Francisco
Headquarters

Board of Governors

EDWARD H. HARMS. Chairman
H. H. BRANN
JOSEPH J. CONEY
PHILIP COXON
BERN DeROCHIE
L. M. EDELMAN
W. EDGAR MARTIN
GEORGE SWETT
CHARLES E. FINNEY
JOHN T. GREANY
C. M. Le COUNT
FLETCHER MONSON

New Members:

Howell H. Ware
Robert L. Gray
A D. Keil
L. R. Kerdell
C A. Ames

Propeller Club of California Stages Two Fine November Programs

November 16

Harley Bennett, of Columbia Steel Company, addressed an audience which was well-nigh a record-breaker in attendance . . . men of the marine industry eager to learn the manner in which a tremendous bridge has been erected across their San Francisco Bay.

The explanatory comments of our speaker preceded the projection of one of the most absorbing films we have seen. A real projessional job—this U.S. Steel movie! Well conceived, well edited, exceptional photographically, it told the story of the bridge from the opening chapter down to the dedication ceremonies. Technical facts were clearly treated. Engineers and laymen alike got the message. The film does credit to its sponsors—it is a magnificent work.

Of special import to maritimers were the views of the construction and transportation of the giant caissons, the barge work and other details requiring water-borne handling.

U. S. Steel pays fitting tribute to the men behind the big project—not only the designers, but the builders as well.

An enthusiastic reception was accorded the program. Harry Haviside wielded the gavel, introducing our guest speaker and other notables who were aboard for the big event.

November 24.

An industry—as new as tomorrow—has developed right at our front door! Deep sea sardine fishery has meant new tonnage for our American merchant marine. California has benefited from these new jobs, as many of the Coast ships have been reconditioned, rebuilt and outfitted in our local yards.

The story of the development of the fish-reduction industry was told at our last meeting to an interested group of marine men. Stanley Hiller was guest speaker, and his fine talk was illustrated with a sound movie which brought us aboard one of the mother ships outside the Gate. Here we were shown the complete routine—from the catch through the processes of reduction and to the final handling of the product at San Francisco's wharves.

Interesting were facts and figures covering the amount of the annual traffic . . . the amount of mechanism and man-power involved . . . the various uses of the fish meal, and other high lights.

Speaker Hiller was introduced by Joseph Coney, member of our Board of Governors.

After serving with McCormick Steamship Company since 1923, **H. V. Wheeler** has been promoted general agent at Seattle for the company. For the last 12 years he was general agent at Tacoma, but began his career with McCormick in Seattle in the operating department, which he left after a year's time to go to Tacoma as general agent. When **B. C. Bentzen** resigned as district manager in Seattle, several promotions in different departments resulted, including Wheeler's transfer.

Before he joined McCormick, Wheeler was with the Northern Pacific Railway Company and later with Charles L. McCormick Lumber Company.

Under the new arrangement, **J. G. Nordgren** has replaced Bentzen as district manager, and **J. C. Harper** has been named general freight agent.

Word comes from Los Angeles that **J. H. Fay,** general freight and passenger manager for the Los Angeles and San Francisco Navigation Company for many years, has resigned to accept the post of general manager for the Consolidated Olympic Line, new coastwise steamship company. The line is headed by **J. C. Strittmatter** and **B. C. Bentzen,** the latter recently resigned from McCormick, and is expected to begin operations as soon as strike conditions permit. Coastwise freight service between Los Angeles and Seattle, via San Francisco, and between Los Angeles, San Francisco and Portland, will be offered. Inauguration of the service will be effected by the steam schooners Eldorado and Lake Frances.

J. F. McConkey, Pacific Coast manager for the Sperry Gyroscope Company, with headquarters at San Francisco, has recently returned from a two-months' tour of middle west and Atlantic Coast cities, covering Dayton, Cleveland, Washington, Philadelphia, and New York. This tour was undertaken by J. F. in order that he might keep in close personal touch with the many new developments in the gyroscopic and electrical equipment manufactured by his firm.

He comes back to San Francisco filled with enthusiasm for the future of American transportation on the sea and in the air.

VOYAGES

## ● Peter P. Mesquita

Paralleling the destiny and success of the big shipyard of which he is an officer is the business career of Peter P. Mesquita.

"Pete," as hundreds know this personable young man, started with the George Armes firm when the articles of incorporation were signed, and has come up the ladder from accountant to the office of secretary-treasurer, which he now holds.

Barbieri Studio

Peter P. Mesquita, secretary-treasurer of General Engineering & Dry Dock.

His business life has always followed the construction industry. When he graduated from Heald's in San Francisco, Pete Mesquita found his first job with the P. G. & E. in a Lake Spaulding construction camp—'way up near Emigrant Gap. One year of the tough going found the lad ready for promotion to the corporation's warehouse department, where, over a six-year period, he worked up to the job of chief clerk, supervising the work of 35 employees.

In 1919 shipbuilding boomed and beckoned and Pete joined up with the Moore company over in Oakland. He saw some very lively action over there during those years, and one of his most responsible jobs was directing the Accounts Payable department. After a short experience with Great Western Power at Caribou Dam and with the A. M. Castle Company in San Francisco, he joined General Engineering & Dry Dock Company in May, 1923, and has witnessed the development of the firm's facilities and resources for the past thirteen years.

Active in civic affairs, he has taken a foremost part in the statewide organizing of the Dad's Club—qualifying for membership with a son, a daughter, and a keen enthusiasm for helping young Californians.

"What's your hobby?" we asked him.

"Well, sir, I don't know if you'd call it a hobby or not—but I swim every day of my life!"

"Sounds more like a habit," we ventured, but now we understand why Peter P. is a member of the Athens Club of Oakland, which reminds us—he is a Propeller Club of California member and hasn't missed a banquet! His associates — fellows like Frank Fox, Fletcher Monson, Charley Renwick, Ralph Barker — call him a "great guy" which, in the 1936 lexicon of men, is praise in excelsis.

Effective November 1, **John W. White,** formerly managing director of the Cia. Westinghouse Electric Internacional, S. A., with headquarters at Buenos Aires, Argentina, was appointed general manager of the Westinghouse Electric International Company.

Born at Indianapolis, Indiana, on January 6, 1889, Mr. White entered the employ of the Westinghouse Company in 1905 and continued at the main works at East Pittsburgh until 1912. In 1917 he filled the position of manager of the central station and transportation divisions of the Detroit office.

His first connection with export was in 1918, when he was assigned to Cuba as Westinghouse manager, with headquarters at Havana. In 1925 he was made managing director of the then Westinghouse Company of Japan, with his staff office at Tokio. In 1931 he was made managing director of the Westinghouse Company in the Argentine, which position he held until his present promotion.

Mr. White will make his headquarters at 150 Broadway, New York City.

● Al Zipf

Albert F. Zipf, well known on the Coast for many years, passed away unexpectedly at his home in San Francisco recently. He was vice-president and general manager of the Williams Steamship Corporation and San Francisco district manager of the American-Hawaiian Steamship Company at the time of his death, and had long been identified with Coast shipping activities.

Mr. Zipf was born in Idaho City, Idaho, 62 years ago, and came to San Francisco when ten years old. Four years later he set out for himself, and his life from that time on was a varied one of travel and success. His first employment was with Wells Fargo & Co. as office boy, and when he had worked up in the organization he left to go with the Alaska Commercial Company as clerk for St. Michael, Alaska. He remained with this company for twenty-four years, at the end of which time he was general manager of its transportation business on the Yukon River.

When the company sold its interest to the White Pass and Yukon Route, Mr. Zipf went with the boats as traffic manager for five years, after which he entered the Pacific Steamship Company as traffic manager, leaving to join the Carlisle Packing Company, operating salmon packing canneries on Puget Sound and in Alaska. He stayed with the company for four years, when he went with the Paramount Picture Corporation advertising department in New York, which he left to take the Pacific Coast managership of the Williams Steamship Company. When the company was purchased by American-Hawaiian, Mr. Zipf continued in charge of its affairs, and in addition took over the duties of district manager of American Hawaiian in San Francisco.

● H. Westfal-Larsen

We note the recent death of **H. Westfal-Larsen,** founder of the Norwegian shipping organization, at Elsinore, Denmark, which marks the passing of a ship operator who started from a modest beginning and brought his company into world prominence. Cabled announcement was sent to **Captain Einar Petersen,** personal representative of the company on the Coast.

The stranding of the Ohioan near Seal Rock was the indirect cause of the death of **Robert W. Dodd,** booking agent for the Luckenbeach Steamship Company, who suffered a heart attack after climbing the cliffs for a view of the stricken ship. Dodd was well known on the Coast, being first associated with the Toyo Kisen Kaisha, then with the Southern Pacific Company, and later with the old California & Eastern Steamship Company, which he left to go with Luckenbach five years ago.

● New I.M.M. Officials

W. Herbert Maybaum has been appointed to the post of general passenger agent of the International Mercantile Marine Company, with headquarters at Los Angeles, it was announced recently by **P. V. G. Mitchell,** vice president of the company.

Maybaum, who was chosen to fill the vacancy caused by the death of **W. F. Ohlson** on September 17, assumed his new duties on November 1. He is a native of Brooklyn and grew up in the International Mercantile Marine Company organization. His wide experience in executive positions in every branch of the passenger department in the years that followed has given him unusually high qualifications for the important post he now fills.

In 1919, reporting back to civilian duty after the war, he was made chief clerk in the second cabin department, and later had charge of second class bookings for the White Star Line, then owned by the company. In September, 1923, he was appointed manager of the passenger office of the company at Cleveland, and three years later went to St. Louis as southwestern passenger and freight manager. From St. Louis he returned to New York in 1929 to become manager of the third class department. It was at this time that he originated "white collar" third class tours, which became so important a source of revenue when quota laws had reduced immigration to a thin and unprofitable stream. He also developed the highly successful three-week tours to London and Paris by a fast liner, designed to attract business people who had very limited vacation periods.

Early in 1935, Maybaum was appointed to the post of manager of the agency and sales promotion department, one of the most important branches of the passenger organization, which **Felix C. Gautier** was appointed to fill. Gautier, like his predecessor, joined the company at the age of sixteen as an office boy, and has served in different departments of the company for the past 31 years.

James S. Mahool, general passenger traffic manager of the International Mercantile Marine Company for the past nine years, announced, on Oct. 24, his decision to retire on Nov. 1, after 34 years of service with the company. In doing so he is taking advantage of the terms of the new retirement plan adopted by the company last July, which substantially reduces the minimum years of service required for retirement. He will be succeeded by **John F. Brennan,** general passenger agent in charge of the tourist and third class departments of the company.

On October 22 announcement had been made that after forty-five years in the transatlantic passenger business, **David Lindsay,** assistant general passenger traffic manager of the International Mercantile Marine Company, would retire, because of illness, at the end of the year.

Captain William E. Carley, for the past two years assistant marine superintendent of the International Mercantile Marine Company at New York, has been appointed general superintendent of the Panama Pacific Line, with headquarters at San Francisco, it was announced by **A. J. McCarthy,** vice-president of the company. Succeeding **Captain Kirkwood H. Donavin,** who recently resigned, Captain Carley took over his new duties on October 15, in which he will assist **W. H. Hoskier,** Pacific Coast manager.

Twenty-six years' experience with ships at sea and ashore, and a broad understanding of the men who serve them, have made Captain Carley the logical choice for the post he fills.

Captain F. E. Lovejoy, president of the Puget Sound Freight Lines, was elected vice president of the Propeller Clubs of the United States for the Pacific Coast area at the recent annual convention, held in Boston.

Personals

The following appointments have been announced by **J. F. Brennan,** passenger traffic manager of I.M.M.

David D. Porter as general passenger agent Panama Pacific Line. Porter entered the shipping business with the shipping control committee in New York during the war, joining I. M. M. in 1919 and the Panama Pacific Line in 1934.

Alphonse T. De Riesthal as general passenger agent, cabin department, United States Lines. He went with I. M. M. in 1920, and made a tour of U. S. Lines' European offices in 1927.

Kenneth F. Gautier as general passenger agent, tourist department, United States Lines. Gautier has been with I. M. M. since 1920.

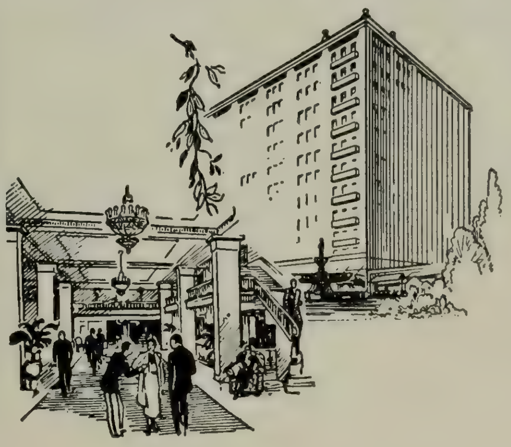
Karl Vaupel as general passenger agent, third class and prepaid departments, United States Lines. Vaupel has been with I. M. M. since 1902.

Two important executive personnel changes at the Cummins Engine Company, Columbus, Indiana, were announced recently by **Paris E. Letsinger,** vice president in charge of sales. Effective November 1st, **C. A. Buxton,** formerly general service manager of Cummins, was made assistant sales manager. His work will be with Letsinger. For the past twelve years Buxton has been with the Cummins organization; in the capacity of works manager for a number of years, then later purchasing agent, following which, in 1933, he was made general service manager.

Succeeding Buxton in the position of general service manager is **Dave S. Craven,** until recently of San Francisco. He was lately in charge of the transportation equipment of the Purity Stores, Ltd., one of the larger chain grocer organizations, with headquarters in San Francisco, and one of the first users of Cummins diesel engines on the Coast.

Letsinger also announced the subdivision of the United States into four regions with four district managers in charge of the respective dealer organizations. In the Eastern region is **Deloss C. Cummins,** with headquarters in New York; in the Southern region, **Jerome C. Chambers,** with headquarters in Fort Worth; in the Central region, **A. E. LeBlanc,** with headquarters in Chicago; and in the Western region, **Dave Buttles,** with headquarters in Fresno.

Dearborn Clark, traffic manager, American-Hawaiian Steamship Company, announces that the company will complete the liquidation of its wholly owned subsidiary, Williams Steamship Corporation, on December 1. After that date the present Williams Line service will be known as American-Hawaiian South Atlantic service. "B" line rates will continue to be quoted as in the past.



In Los Angeles it's the

New HOTEL CLARK

555 ROOMS BATHS

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Famous from Coast to Coast for Good Food

Visit the "TAVERN" a quiet retreat—tucked away in the rear of the lobby.

Downtown—5th and Hill—directly opposite the Subway Terminal. The most convenient . . . the best accommodations . . . the finest meals in Southern California. Easy chairs, sleep-inspiring beds, large rooms with luxurious fittings. Unsurpassed service is yours at amazingly low cost.

Personal Management of P. G. B. MORRISS

KOLSTER
RADIO DIRECTION FINDERS

As essential to present-day navigation as the sextant and pelorus

THE Kolster Direction Finder (Radio Compass) has been installed on more than 400 ships operated by seventy representative steamship lines of the American Merchant Marine, United States and Foreign Government services, and on many private yachts. As essential to present-day navigation as the sextant and the pelorus, navigators depend upon it to furnish bearings in dense fog and at long distances and to ascertain the position of other ships with an accuracy equal to that obtainable with visible sights.

Today Mackay Radio—pioneer in this field with Frederick A. Kolster, inventor of the Direction Finder (Radio Compass)—presents a complete new line designed to meet the requirements of all types of ship—from yachts and small commercial craft to the greatest ocean liners—at prices within the range demanded by the most rigid economy.

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